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July *1953*

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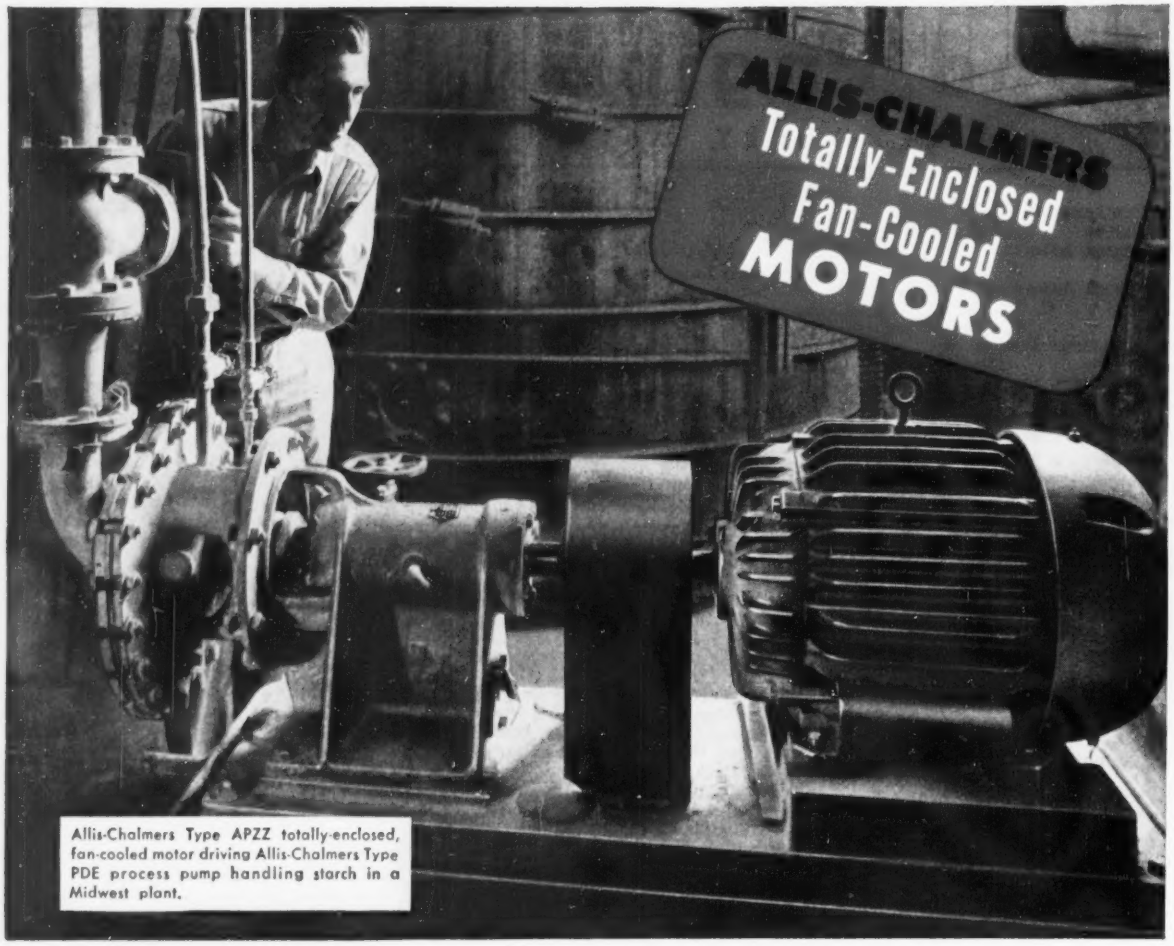

Allis-Chalmers Type APZZ totally-enclosed, fan-cooled motor driving Allis-Chalmers Type PDE process pump handling starch in a Midwest plant.

Get These 3 Low Maintenance Features

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Frame, conduit box and fan cover of cast iron resist corrosion. Fan is non-sparking, corrosion-resistant material. Well suited to outdoor operation.

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Ball bearings are double-shielded type, pre-lubricated at the factory. Periodic lubrication is not required under normal operating conditions, but provision is made for in-service lubrication if necessary.

GET COMPLETE INFORMATION on Allis-Chalmers motors for indoor and outdoor service — complete with Allis-Chalmers coordinated control — from your nearby A-C Authorized Distributor or District Office, or write for Bulletins 51B7286 and 51B7149. Allis-Chalmers, Milwaukee 1, Wisconsin.

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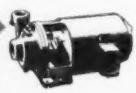

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ALLIS-CHALMERS

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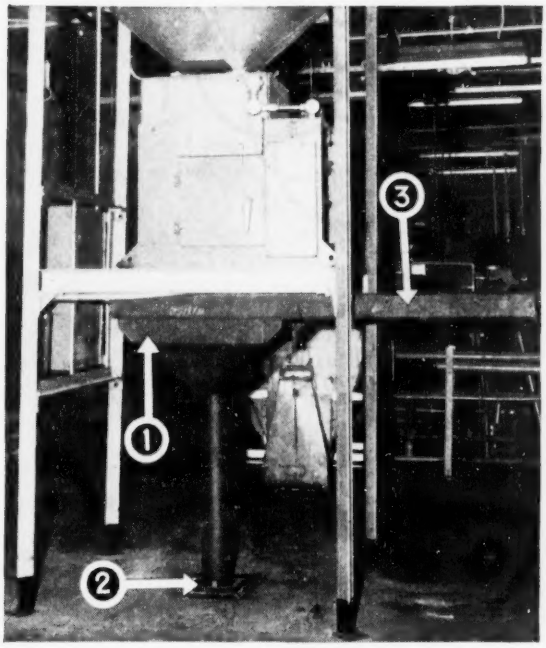
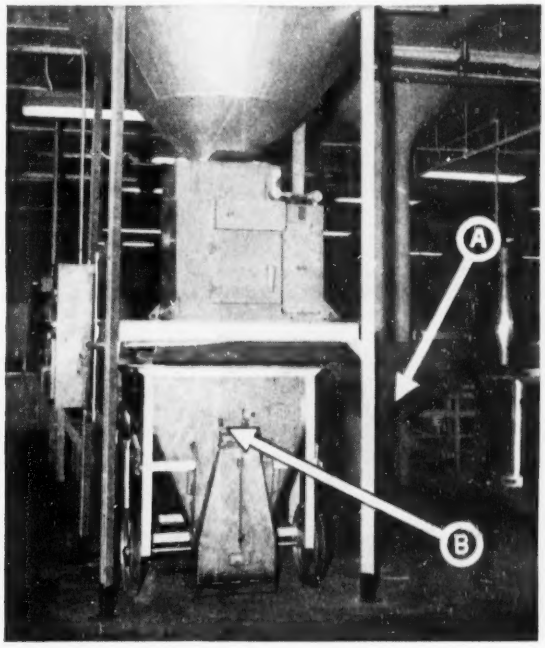
PRACTICAL IDEAS





Two-Floor Discharge From One Scale

Installation of a duplicate hopper and batch scale dispenser was avoided at our plant by simple and relatively inexpensive fabrication of a movable cone and spout, mounted on casters.

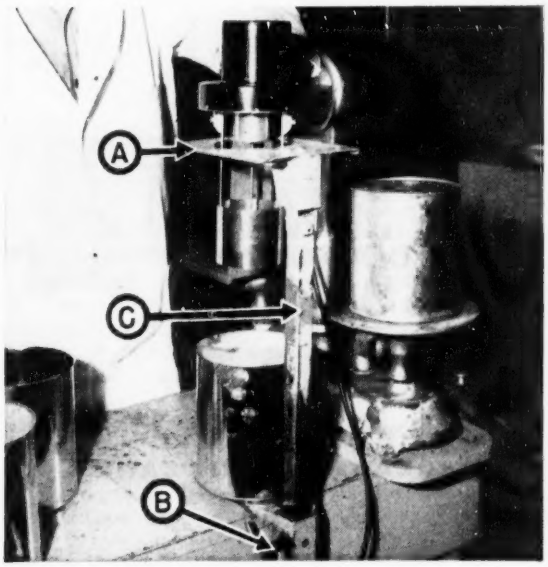
On the second floor, batches of sugar are weighed regularly into carts for transportation to syrup processing kettles. Weighed amounts of sugar are also required in processing operation on the floor below. Weighed batches could not be delivered from one floor to the other by cart, since there were no elevators.

Of the two choices—installing a hopper and scale on the first floor, or providing means for delivery of weighed amounts other than by cart—the latter means was adopted.

This is how processing needs on both floors are met by single batch scale:

Funnel-like trough, (1) in left photo, was constructed to receive the weighed batch of sugar from scale and direct it down a pipe, through a hole cut in floor (2), to duct-discharge on floor below.

Trough is suspended on rollers that travel on channel-iron supports (3). When sugar is to be supplied for second floor use, trough—(A) in right photo—is rolled to one side on its track to make room for cart (B).—*D. B. Bradshaw, Plant Engineer, A. H. Johnson Co., Brighton, Boston.*



Reamer Made Into Instrument Support

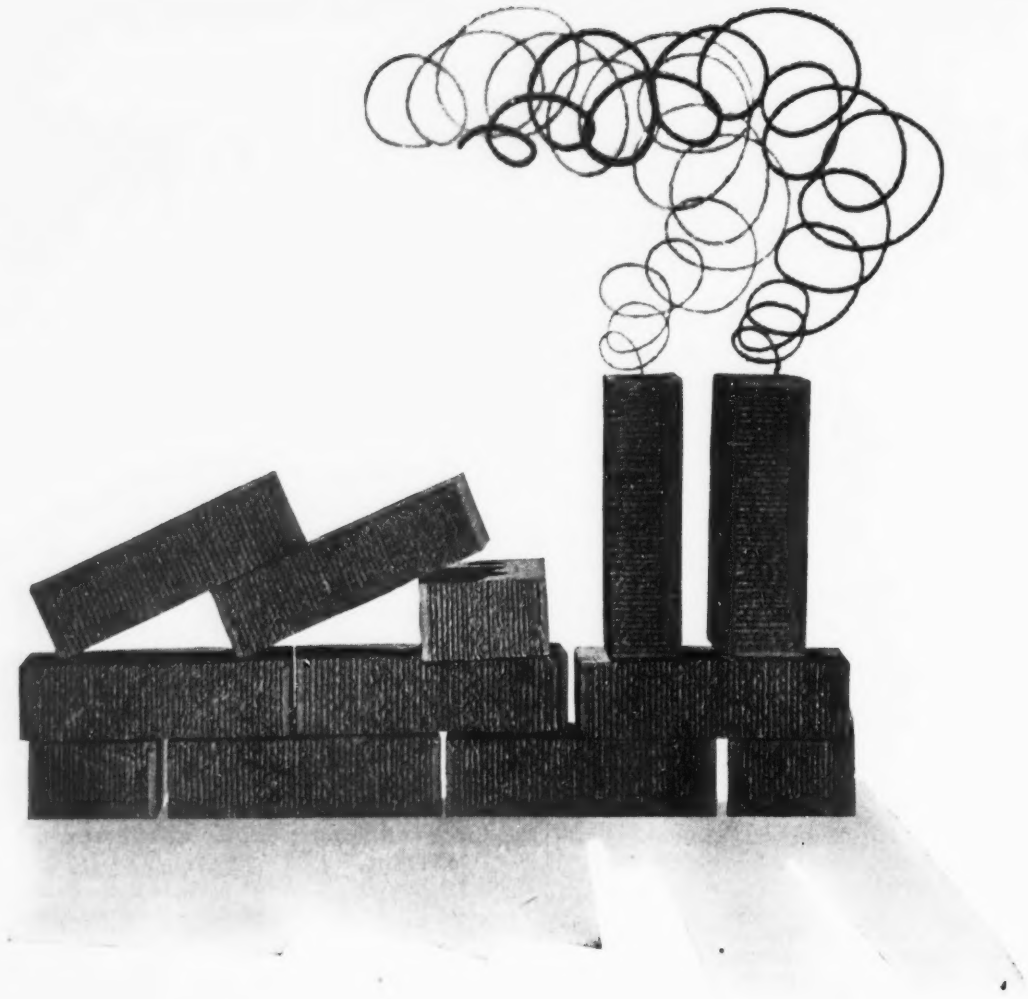
A discarded, bench-type, hand operated can reamer was easily converted at our plant into a satisfactory support for a viscosimeter, thus reducing chance of injuring unit and cutting down former messiness.

Our difficulty arose when, though we used the instrument regularly for testing consistency of syrups, the checking operation was intermittent. When not actually employed for determinations, unit was laid on the only surface available, the table—which soon was coating with a sticky mess, unless time was taken frequently for careful cleaning.

Laying instrument on the table also invited costly damage to expensive equipment and consequent tie up of control of quality.

To adopt can reamer to its new function, a plate—(A) in photo—was attached to top of device to replace cutting element. Into plate a hole had been cut to form the support.

Height of operating element of instrument can be adjusted by loosening or tightening threaded bolt (B), permitting shaft (C) to be raised or lowered.—*Robert Horn, Plant Engineer, Henry & Henry Inc, Buffalo.*



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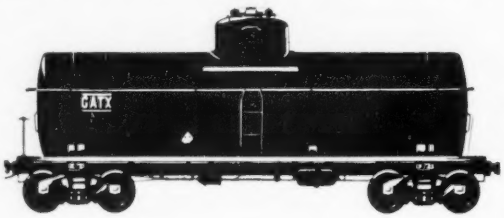
to carry your bulk liquids



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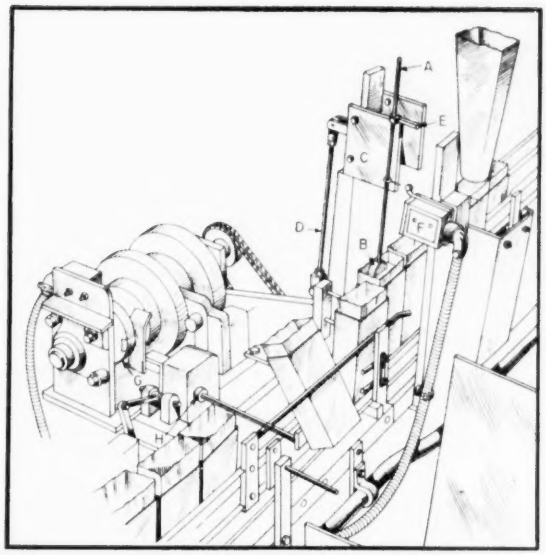


Automatic Empty-Carton Kick-Off

At the plant of Post Cereals Division of General Foods Corp., Battle Creek, Mich., it is now impossible for an empty carton to slip by filler and arrive at closing machine. An automatic empty-carton detector and kick-off now disposes of empties.

This is how mechanism operates:

As each container passes empty-carton detecting-station, a rod — (A) in sketch — with a weight (B) on its end, is lowered into container. Lowering operation is accomplished by a cam-operated down movement of an assembly (C) pushed up and down on a slide by a cam-rod (D). If package is full, detector rests on product as the assembly is lowered. If carton is empty, however, weighted rod continues down until trip bar (E), attached to it, actuates a micro-switch (F).

Closing switch operates spring lever which forces a pin to engage disk (G) and rotate it. On disc is a raised cam-type surface which, as rotation proceeds, actuates solenoid-operated carton-ejector (H). Across conveyor a plate-footed rod is thrust to engage empty carton at its bottom and push it under guide rail to catch-bin.

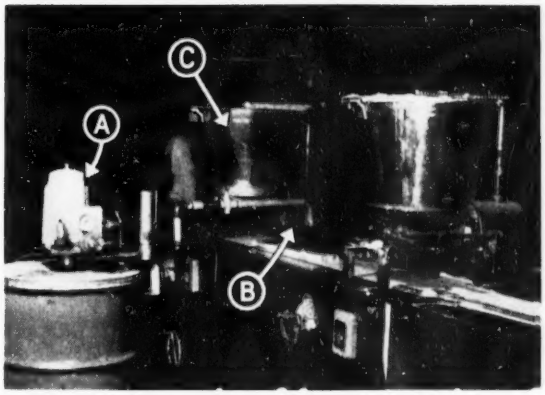
Time which elapses between detecting and removing discard, permits empty carton to advance to kick-off station—*FE Staff*

Control Saves Water, Curbs Splash

When lithographed cans of grape juice concentrate leave the filling-closing machine assembly in our plant, they pass through a spray washer to remove any adhering juice from can surfaces. So long as cans continue to move through washer, water from sprays is confined to unit. However, when line stops, water squirts from washer until valve on water line is closed.

Formerly, getting the line back into operation came first. Water from sprays made floors a mess and squirted on clothing.

This wasteful condition ended when hand-operated valve on water line was replaced by a solenoid valve controlled by line's motor starter circuit. When filler-closing line motors stop, the water line valve to cleaner is closed, opened again when line starts. Water consumption is reduced, splashing ended.—*Kenneth C. Holgate, Plant Manager, Seneca Grape Juice Co., Dundee, N. Y.*



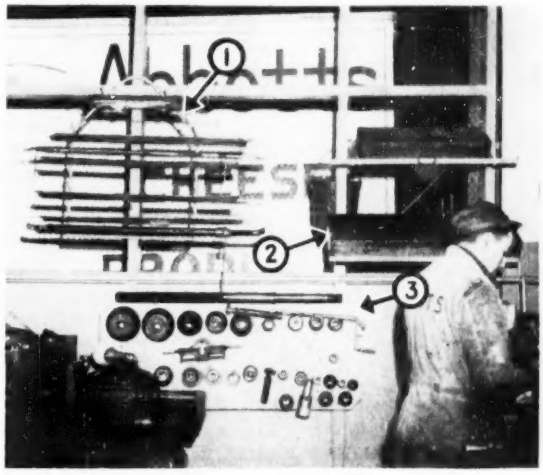
Drum Pump Speeds Production

Since adopting a new and simplified method of applying jelly to baked goods, a more uniform application of the spread has been obtained. Also, less time is required to prepare for a run and less time and effort is necessary during clean-up.

No longer is the contents of a drum of jelly transferred in small batches to dispensers by hand. A pump—(A) in photo—centered in a removable drum cover, sucks jelly from original container and delivers it through many small orifices in a stainless steel pipe (B) onto the baked goods moving along on a conveyor.

Formerly, it was necessary to hand-churn jelly after dumping it into the dispenser hopper (C), in order to break it down to flowable consistency. Now the small holes from which the jelly is forced by the pump reduce spread to the correct consistency for uniform flow over cake.

Pump remains in drum between runs. Cleaning requires but a few minutes rinsing with hot water.—*C. D. Grennan, Jersey Farm Baking Co., Chicago.*



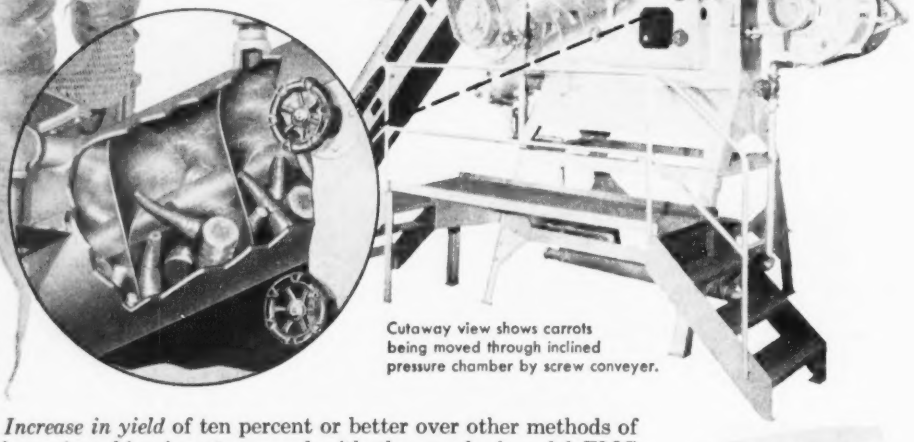
Ways to Keep Things In Place

We have found that by constructing special "just-for-the-purpose" shelves and racks in our repair shop, the condition of tools and equipment is improved, losses are reduced and stock checks and inventories are speeded.

Racks—(1) in photo—made of bent rod to which metal pegs are welded, serve well as a place to keep welding rods. When this type of provision is made rods are

...TOUGH SKINS LOOSENED IN SECONDS

BY THE *fmc* CONTINUOUS HIGH-PRESSURE STEAMER



Cutaway view shows carrots being moved through inclined pressure chamber by screw conveyer.

Increase in yield of ten percent or better over other methods of loosening skins is not unusual with the *standard* model FMC High-Pressure Steamer. Automatically controlled heat penetration provides efficient and uniform loosening of skins without damage to valuable sub-surface nutritional layers. Carrots, beets, potatoes, and many other vegetables (primarily root type) and certain fruits are quickly and continuously processed with big savings in time, labor and steam.

In addition to the standard unit, a *special* model of the FMC Continuous High-Pressure Steamer is now offered with new features which increase capacity from 25 to 50 percent.

Both the *standard* and *special* models are constructed in accordance with ASME specifications.

Write for bulletin which fully describes the FMC Continuous High-Pressure Steamer, or call your nearest FMC representative.

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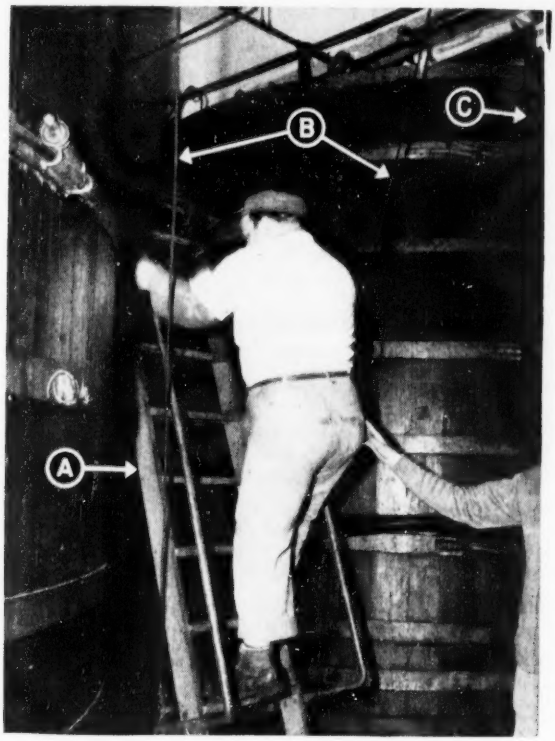
less likely to be mixed, to stray or be lost. Also, as mentioned, a check on stock is readily made.

Loss and damage to valuable, but seldom used tools and their cases, frequently occurs when chests are kept on benches or near work spaces. Building special out-of-the-way shelves (2) keeps tools and cases in place where they are easily located. Also, damage to cases and loss of tools is minimized.

A wall plaque (3) with protruding hooks, each for a designated fitting, will preserve machine tool parts. Only sufficient hooks are provided to accommodate accessories—thus absence of a part is easily checked.—*James Owens, Fleet Manager, Abbotts Dairies, Inc., Philadelphia.*



Aisle Cleared by Lifting Stairs

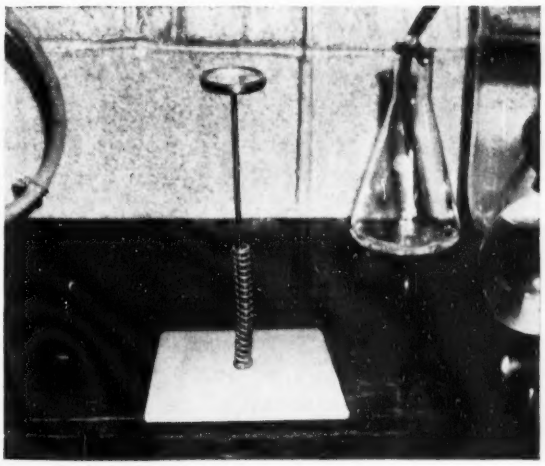
Access to the top of two adjacent, simultaneously-employed processing tanks in our winery was by ladder or stairs. Only possible location for a platform near the top and between tanks, was over a main foot and vehicle traffic aisle.

Use of either ladder or conventional stairs was objectional. When not in use, a ladder had to removed to clear passageway, entailing unnecessary labor and inviting accidents. Preferable from both safety and labor angles was a strongly constructed permanent-type stair with hand rails—(A) in photo—except that it closed aisle to traffic.

Clearing passageway became a simple matter when stairs were hinged at te top of platform between tanks.

Lifting stairs when not in use, to clear traffic lane, was made easy and safe by attaching cables (B) extending over several pulleys to counterweights (C), to foot of stair.

If pulleys immediately over stair are so located that the angle between cable and stair is sufficiently small, counterweights cannot lift stair from lowered position. However, once angle is increased by slightly lifting foot, weights will then help raise stair and also hold it aloft.—*Merton Gassett, Blending Dept., Garrett & Co., Brooklyn.*



Safety Stand for Dial Thermometer

From a 4 in. square of metal plate and a length of coil spring, we fabricated a support in which to place a dial thermometer when not in use.

Because of the disk shape of dial housing, thermometer often rolled off when laid on work table. Now it is safe when placed in its stand.

To make support, merely weld one end of a coil spring to a metal plate heavy and wide enough to provide a stable base. Attached in a vertical position, coil provides a tube into which stem of thermometer is inserted—a tube which will bend, if knocked, instead of tipping over.

If a piece of rubber or cork is pushed to bottom of coil, a cushion is provided for the thermometer stem.—*Frank Callinge, Laboratory, Gerber Baby Foods, Rochester, N. Y.*

$50 Extra for Best Item

You are invited to submit Practical Ideas. You will be paid at regular rates when your item is printed and if it is judged best for the month, you will get an additional payment of $50.

Selection of the best contributed item will be made by a group of 200 readers each month, and the item title and authors name will be cited (see below).

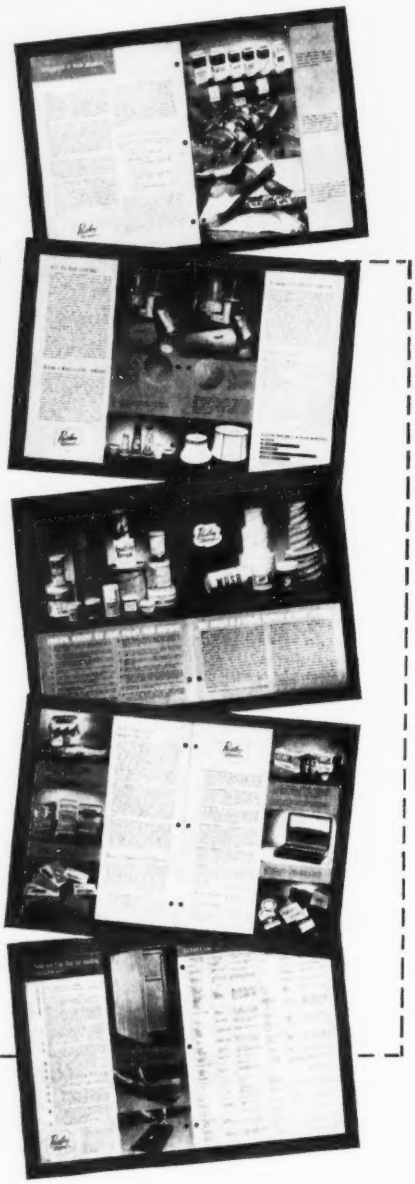
Practical Ideas may describe any type of device or method recently developed to solve a problem, speed an operation, or make some task easier. They may concern factory, laboratory, warehouse, or power-plant operations in the food industry. Ideas on management, maintenance, and trucking or shipping also are suitable.

You need not be an experienced writer or draftsman to submit these ideas. The text will be edited and sketches converted to finished drawings.

Send your items to: Practical Ideas Editor, FOOD ENGINEERING, 330 W. 42nd St., New York 36, N. Y.

MAY PRACTICAL IDEA winner was "Polices Remote Conveyors," by F. A. Wenske, Assistant Superintendent, Plant Maintenance, Eastern States Farmers Exchange, Buffalo. Described was system in which bags moving on conveyor cause special prongs to swing, thus tripping a switch and flashing light at bag-filling station. If flashing stops, operator knows conveyor is clogged.

Here's *VALUABLE INFORMATION* For ALL Users Of Resin Adhesives!



Contains Data Never Before Available For Resin Adhesive Users

Every Resin Adhesive user needs this new Paisley Technical Service Bulletin. It tells you all about Resin Emulsion formulation, properties and advantages of Resin Adhesives, methods of application, tips on handling, and lots of other valuable information. A chart of properties available for various industrial uses is a special feature of this profusely illustrated bulletin. A free copy will be mailed promptly to *Resin Adhesive users asking for it on company stationery!*

TEAR OUT.. FASTEN TO LETTERHEAD AND MAIL TODAY!

PAISLEY PRODUCTS INC., 1770 Canalport Ave., Chicago 16, Ill.

Gentlemen: Without obligation, please send me the new Paisley Technical Service Bulletin No. 23.

☐ We have a special Gluing problem. Send us your Adhesive Operation Data Sheet. (You fill in and return to us for Laboratory recommendation.)

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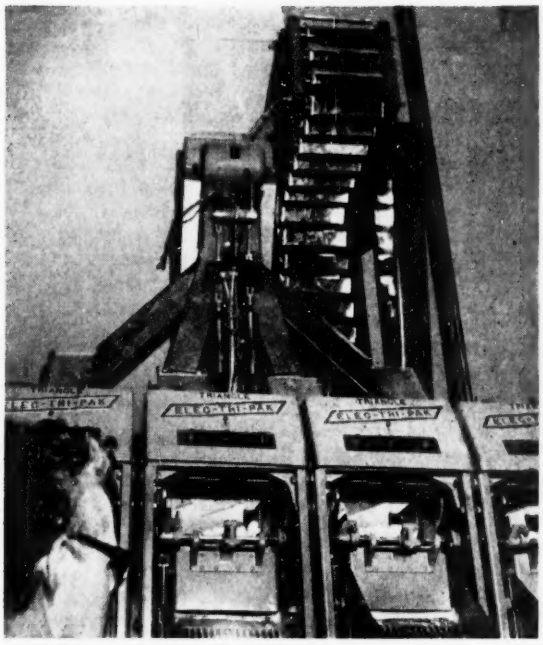


Ends Freezing of Candy at Scales

In installing mercoid switch operated gates limiting feed to each of four compartments feeding the scales of our net weight filler, we made it very unlikely that plastic buttermints would stick together or "freeze" in the filling machine hoppers.

Product is emptied from bucket conveyor into feed hopper divided into four compartments, each feed-end into a chute to a scale. Mercoid switch operated gates which control flow of product into each of these compartments, close whenever a predetermined volume of candy accumulates in a compartment. Gate opens when excess moves through scale.

When gate closes, excess from conveyor is chuted back into air-conditioned cooling room and eventually returned to hopper via bucket elevator.

Thanks to this control mechanism, less than 2-second product flow is stored at any time in the distribution hopper.—*Ray M. Murray, Jr., M. E. Consultant, Vernell's Fine Candies, Seattle.*

Simple Way to Control Rodents

Extermination of rodents can be accomplished at relatively low cost by carbon-dioxide sublimed from dry ice. Required concentration of 20 percent can be obtained by the evaporation of 25 lb. of solid carbon-dioxide for every 1000 cu. ft. of floor area. Heavier than air, CO_2 will blanket area to sufficient depth, therefore height of area is of small consequence.

Although most satisfactory time for gas application is over a week end when an area can be closed to traffic and employees, successful results can be obtained in approximately 20 minutes when an area can be closed off for that period.

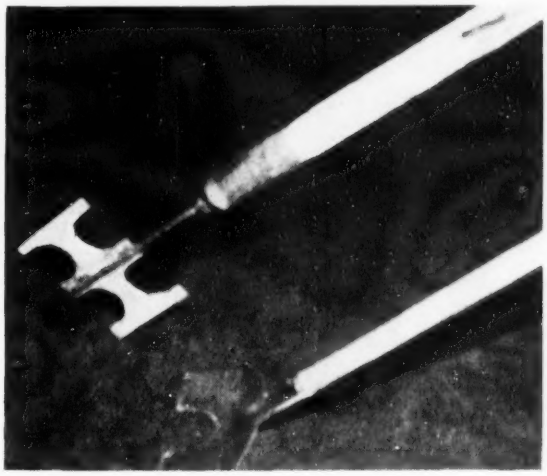
This is the procedure:

Remove all foods from area to be gassed and close all doors, windows and air ducts. Then place dry ice reduced to marble-sized pieces near the center of the area. Conversion of ice to gas can be accomplished in ten minutes if air from a fan is directed across the surface of ice particles.

Gas penetrates rodent burrows, forces them to the surface of floor area, where they are readily collected after death from suffocation. Rarely does an animal die in nest or burrow, and neither building or equipment is contaminated.

Clean-up operations are minimum, requiring merely removal of extinct pests and a change of air in area.

Since gas of sufficient concentration will suffocate humans, oxygen masks should be worn by workers while engaged in extermination procedure.—"*Food Manufacture*." *(England)*.



Frost-Scrapers Made at Low Cost

Simple tools that will function satisfactorily in removing snow from refrigerated coils located overhead or along walls, are easily made from sheet metal.

To construct the handy frost scraping implement—for ceiling coil scraping, cut V-shaped grooves in an 8 by 5 in. steel plate. Distance between parallel sides of U should equal diameter of pipe in coils.

Grooving is conveniently accomplished by locating with a center-punch two points on both of the 8-in. sides of plate. Distance between points should be equal to spacing of pipes in coil (center to center).

Now place a section cut from coil pipe tangent to plate edge at each of the center-punch points. Outline circumferences on plate and then, after adding lines tangent to circles and perpendicular to wide sides of plate, with a torch cut out four U-shaped areas thus formed, and grind edges to a V.

When grooved plate is welded to a rod which in turn is secured to end of a long pole, scraper is ready to use. One pair of grooves will remove top frost when pulled along coils, the other set will clean coil bottoms when thrust forward against them.

A single-grooved scraper, mounted on a short handle, serves to effectively clean frost from front of wall-coils.—*L. M. Jordan and Dorsey Davis, Phillips Packing Co., Cambridge, Md.*

Cooling Aided by Air Mixing

Applying air to circulate water being cooled in a tank has several advantages.

In our plant, water for washing cottage cheese curd is cooled and stored in a 1800-gal. insulated tank. Air to

choose the stainless that does the best job

No one stainless steel meets every set of service conditions. And you should not pay extra for special properties you don't need. You can economize too, by selecting alloys especially designed for your fabricating processes.

Crucible produces around thirty standard alloys and many other special types of REZISTAL stainless steel. To help you choose the proper grade, our field representatives are prepared to bring you the latest and most complete metallurgical and fabrication data available on the application of stainless steel. And our plate, sheet, strip, bar, wire and tube mills are equipped with the most completely automatic controls for rolling, annealing, heat treating, finishing and polishing to assure you of unvarying quality in every piece of Crucible REZISTAL.

For assistance in solving application problems and the finest quality in stainless steels, call Crucible.

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agitate the water is admitted through perforations in a pipe located beneath a direct expansion ammonia coil supplying the refrigeration. Air movement maintains flow of water around coils

Heat transfer from air to water is less than that encountered when mechanical agitation is used. However, circulation of water by air bubbling up past ammonia coil is adequate to bring tank contents down to 33 deg. F. with sufficient speed to supply our needs. This is accomplished without insulating coils by freezing water on them.—*J. C. Monk, Chief Engineer, Golden State Company, Ltd., Los Banos, Calif.*

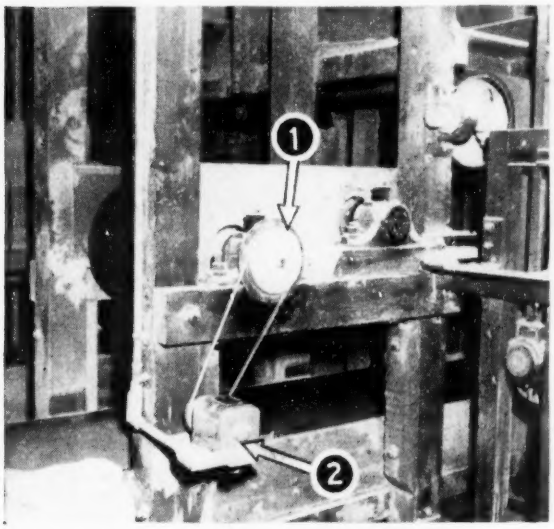
Simple Way to Clean Bean Snippers

Hazards of cleaning bean-snippers by manually operated steam hose are avoided at our plant since we installed a mechanical system for steam cleaning. Also, correspondingly less cleaning labor is required.

Formerly when steam hose was manually manipulated to clean equipment, fellow workers as well as operator faced injury from blast from hose. Now cleaning is completed while workers are away from processing area during break-periods or lunch time.

All that was necessary was to lay a steam line across all snippers, and provide stationary perforated pipe leads located close to snipper cylinder.

Now, while workers are away from the area, steam is brought to all units and blasted against the slots in cylinders as they rotate. Cleaning is now rapid, thorough and safe.—*Oliver Bruno, Superintendent, Haxton Food Co., Inc., Oakfield, N. Y.*



Dead-Conveyor Reporting System

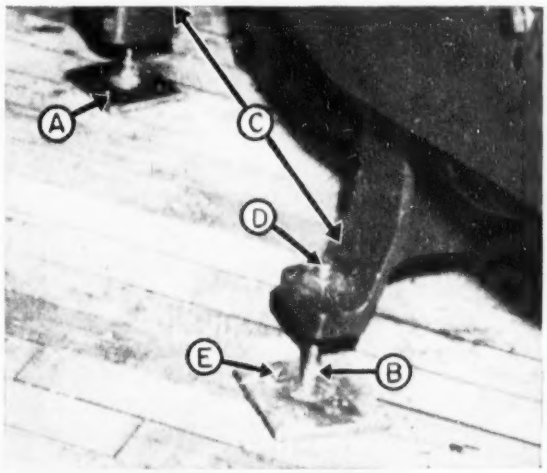
Preventing bags of feed from dangerous pile-ups due to a stopped conveyor along a lengthy, unpoliced network of these movers was a serious problem until we adopted local generator-powered signal systems.

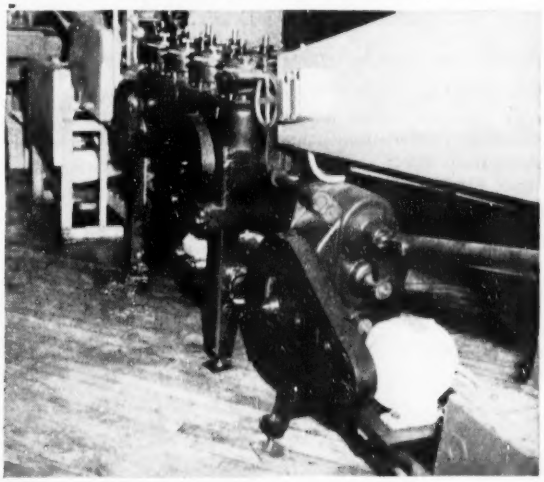
This is how the control mechanism is arranged and operated:

V-belt sheave—(1) in photo—is attached to one extended end of idler-pulley shaft to drive a small generator (2), wired to bulbs on central control panels.

When conveyors are running above a certain speed, sufficient current is produced by generator to light signal lamps. When conveyor slows down, its signal light will dim—and go out when conveyor stops.

When an operator observes such dimming of a signal light, motors can be stopped on proceding conveyors to avoid bag pile-up on dead conveyor.—*F. A. Wenske, Assistant Superintendent of Maintenance, Eastern States Farmer's Exchange, Buffalo.*





Sanitary Units Keeps Machine Level

Using bolts and nuts and 4 in. squares of sheet metal, machine supports which make leveling easy have been fashioned at S. F. Whitman & Sons, Inc. Also, through adoption of these supports, sanitation has been improved.

This is how supports are made.

Holes are drilled in 4 in. squares—(A) in top photo—cut from $\frac{1}{4}$ in. or $\frac{3}{8}$ in. sheet metal. Into the holes, threaded bolts (B), $\frac{3}{8}$ in. by about 6 in., are inserted and welded in vertical position.

Large nuts are then threaded on the bolt portion of the support and the bolts passed through anchor holes in the legs (C) of the machine.

By adjusting the bolts on which the legs rest, the machine can be leveled, following which lock-nuts (D) on top of the legs are tightened to maintain leveled position. Supports are anchored by lag-screw (E).

It is much easier to maintain optimum sanitation with this type machine support than when machine rests directly on the floor (see bottom photo).—*FE Staff.*

Application engineering . . . *essential to control*

No matter what the product, every plant uses methods, materials and equipment that present problems peculiar to its own production. Specifications . . . size of plant . . . rate of output . . . all impose further unique restrictions.

What, then, about process control instrumentation? To do its job right, it has to be designed with all those factors . . . and many others . . . in mind. And here is where Honeywell Application Engineering steps in.

First comes a thorough investigation of control requirements. A Honeywell engineering representative, well versed in instrumentation techniques sits down with process engineers, production men, and instrument technicians . . . discusses details of the specific process. Then he puts the problem up to Honeywell's staff of application engineers.

Specialists for Each Industry

In this group are men who are expert in each specific industry. One group, for example, specializes in instrumentation for the metalworking industry . . . another for chemical . . . another for petroleum . . . until the whole gamut of modern manufacturing is represented. Each man has been trained, by education and first-hand experience, in the techniques of processing and process control in the area of his interest. Each is a living part of the industry he serves. And he knows why and where every process "is different."

Covers All Aspects of Control

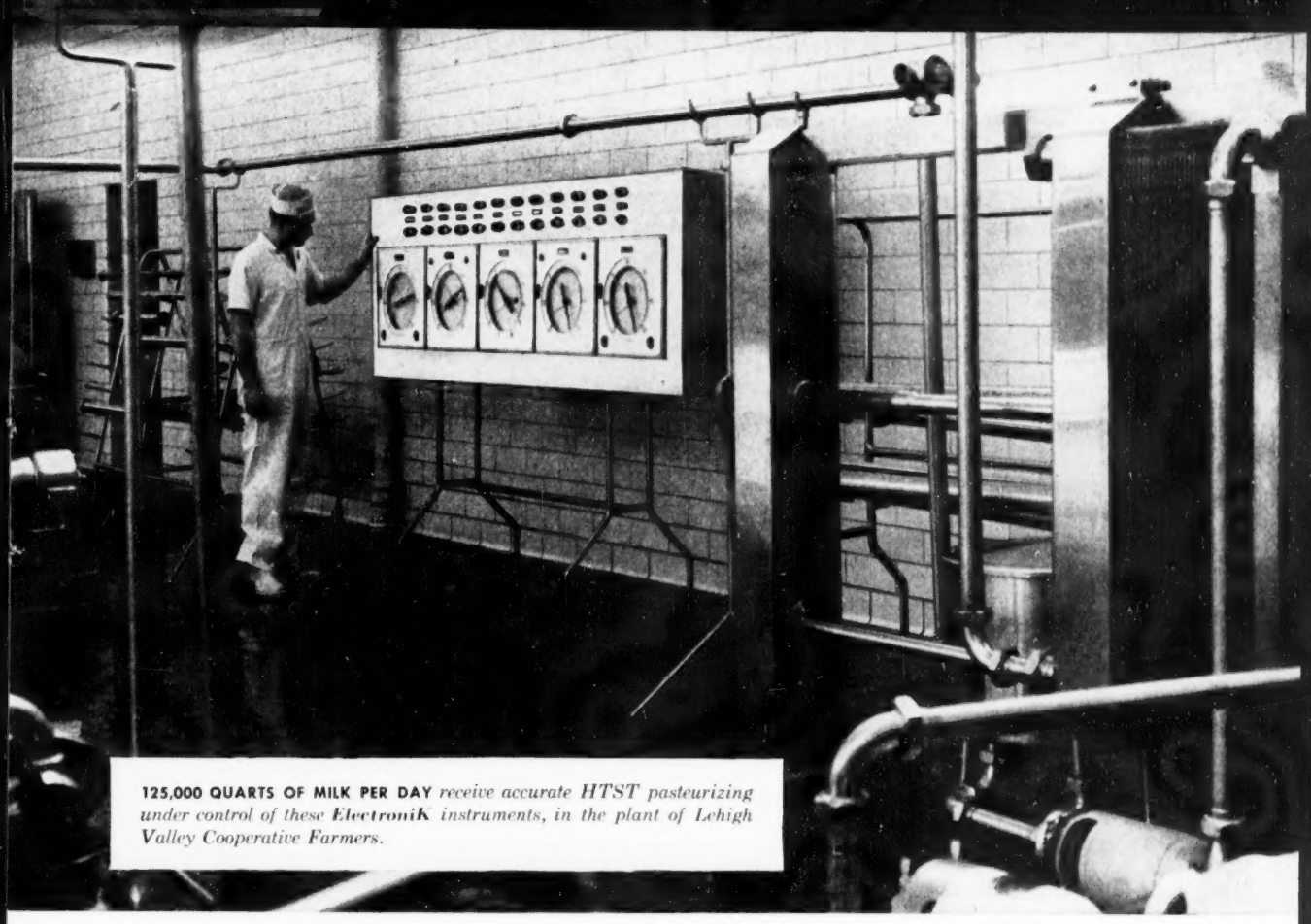
Honeywell application engineering covers the entire control installation. It works out details of what instrument to use for each measurement or control function . . . what type of primary element . . . what control system . . . what size and style of valve. It provides all essential signals, safety interlocks, and accessories. It combines all these elements into a complete unit, arranged for peak production efficiency . . . greatest convenience of the operator, and for maximum ease of service . . . custom-fitted to the individual needs of the process to be controlled.

Saves Time . . . Produces Top Performance

This Honeywell service gives specialized consultation on complex control problems that would otherwise require the attention of experts in the individual plant. But most important, it assures a control system that will produce the superior performance that Honeywell instruments are capable of giving . . . and which will help to obtain the most production and best quality from the process which it serves.

Modern dairies *for safe,*

SOUND PLANNING, *based on specialized engineering experience, forms the basis of Honeywell Application Engineering. Here a round-table discussion between customer and Honeywell technicians irons out the initial control requirements for a process.*



125,000 QUARTS OF MILK PER DAY *receive accurate HTST pasteurizing under control of these* ***ElectroniK*** *instruments, in the plant of Lehigh Valley Cooperative Farmers.*

choose Honeywell control *efficient* HTST *pasteurizing*

Like many other leading dairies, the Lehigh Valley Cooperative Farmers, Allentown, Pa. utilizes short-time pasteurizing as the sanitary, high-production way to process milk. And in this modern plant Honeywell engineered instrumentation maintains precise, automatic control of the pasteurizing equipment.

Most critical phase of the operation is maintenance of correct pasteurizing temperatures. An *ElectroniK* Thermal Limit Controller does this job... instantly calls for diversion of milk if the temperature falls below 161° F. To complete the control of the process, additional *ElectroniK* instruments regulate temperatures of hot water, and record temperature of milk in the cooler.

A vital element of the system is the Honeywell *Flo-Guard* diversion valve. Its simplified construction cuts clean-up time to a minimum . . . prevents incorrect assembly after cleaning.

Engineered as a unit for the individual pasteurizing set-up, Honeywell HTST Control incorporates every feature for simple, efficient operation. Its rugged construction and unit design assure continuous duty . . . simplify maintenance.

Your local Honeywell engineering representative will be glad to discuss how this control can be applied in your plant. Call him today . . . he is as near as your phone.

MINNEAPOLIS-HONEYWELL REGULATOR CO., *Industrial Division*, 4502 Wayne Ave., Philadelphia 44, Pa.

● **REFERENCE DATA: Write for Data Sheet No. 3.4-6, "HTST Control System."**

MINNEAPOLIS
Honeywell
BROWN INSTRUMENTS
First in Controls

CHEVROLET ADVANCE-DESIGN TRUCKS

More work per dollar . . . and here are 4 powerful reasons why!

MORE POWER AT LOWER COST! Watch costs go down when you put the new heavy-duty power of Chevrolet's advanced Loadmaster engine to work! The new high-compression ratio of 7.1 to 1 in this great engine brings you more power and even greater economy than before. Chevrolet's Thriftmaster engine, too, in light- and medium-duty models offers exceptional economy of operation.

FACTORY-MATCHED TO THE JOB! Some jobs demand more power. Some demand stronger springs. But, *whatever* the requirements of your job, Chevrolet trucks are carefully *factory-matched* to the work to be done, with the *right* power—and the *right* units from tires to axle, springs to clutch—to handle that work at lowest cost.

MORE RUGGED THAN EVER! There is extra economy, too, in the exceptional stamina of Chevrolet trucks. You can expect new ruggedness and strength with heavier, more rigid frames and brawnier construction throughout. You can expect extra miles added to the life of your truck, plus a substantial reduction in the over-all cost of hauling.

LOWEST PRICED LINE! Chevrolet trucks are known for qualities and features matched by no other trucks. Yet, with all these advantages, the Chevrolet line lists for less than any other trucks of comparable size and specifications. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTIPANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

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first in demand
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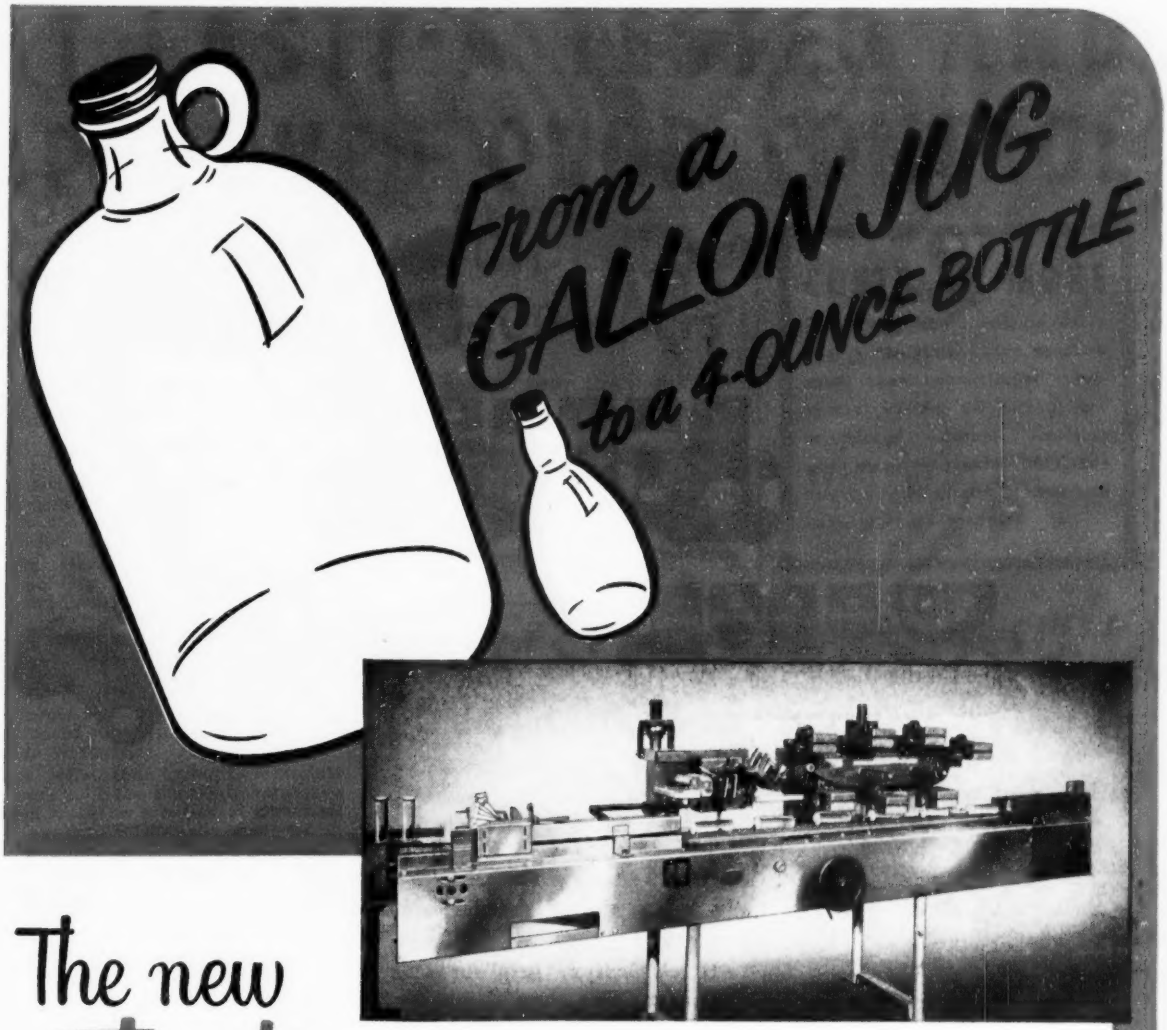
in sales



The new Thrifty LABELER handles them all!

If your line consists of various sizes, the new THRIFTY Labeler is the machine for you! It will label a gallon jug or a 4-ounce bottle with equal facility. Size change is made in a few minutes by simple adjustments.

Odd-shaped bottles or containers with recessed surfaces pose no problem. A unique *flexible pressure* device presses the labels down after they have been applied. A firm, strong seal is assured — even if the container is hot, cold, wet or dry. Thermoplastic or hot-melt adhesive may be used. Labels may be rectangular, round or fancy cut.

Low in initial cost, high in operating efficiency, the THRIFTY Labeler is the ideal machine for plants now labeling by hand as well as for those using machine-labeling.

Write for complete information

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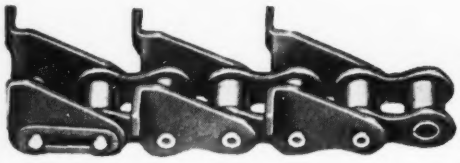
HELP



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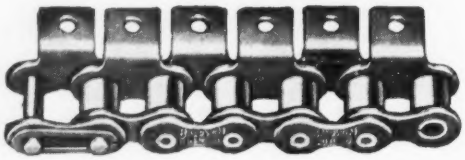

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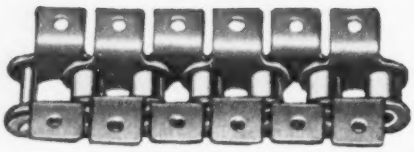

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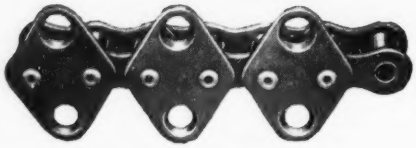

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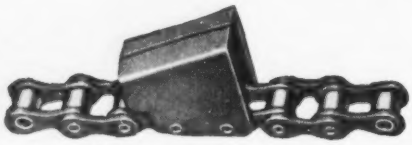

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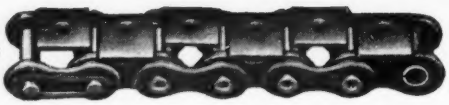

Here's plenty of "help" for you if your problem involves the movement of material to, through and away from a machine.

In the complete Baldwin Rex® line of roller chains you'll find just the attachment you need for most efficient, low-cost product movement. Illustrated here are only the most popular attachments...there are many other styles available, and the complete line is made for each size of chain.

When selecting chain attachments, it is important that you select the attachment that is *exactly* right for your conveyor. Only then are you sure of getting maximum efficiency from your operations. That's why it's always a good idea to call in your Baldwin Rex Field Sales Engineer for help when you're selecting chains and attachments. His specialized knowledge can prove extremely valuable to you. For the complete story, send today for our Bulletin 50-35 on "Chains and Attachments for Low-Cost Conveying." Chain Belt Company, 4783 W. Greenfield Ave., Milwaukee 1, Wis.

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AT LAST! A TESTED AND APPROVED ODOR CONTROL

*New Brooks POLY-CIDE Line Acclaimed By Over 100 Users**

Forward looking food processers ranging in size from the industry's giants to small regional plants have tested and are now enthusiastically using Brooks Poly-Cides to check odors.

The tremendous success and accepted superiority of the Poly-Cides is credited to the Brooks policy of treating each job individually.

Eight years ago, the 76 year old Brooks Organization began specializing in odor controls. An intensive program of research and field development work with primary emphasis on food plants and food by-product plants resulted in a more practical approach to odor control. Brooks chemists and engineers soon found that each plant was faced with an odor problem peculiar to itself.

Thus, rather than trying to formulate a "cure all", the Brooks Laboratories began work on a series of chemicals and methods of applications which could be combined to meet a specific situation.

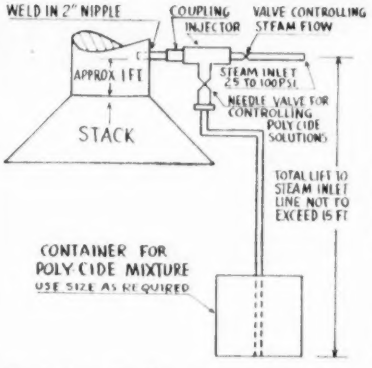
Engineering Service

There's an experienced Brooks engineer in your locality. There is no charge for his services as proper engineering is essential for satisfactory results. The Brooks engineers are thoroughly familiar with all phases of the methods of application; drip feeding, hand or power spraying, etc. They can recommend the correct formulations for Waste Water (*Lagoons, Ditches, Irrigation Fields*), Pea and Bean Vine Stacks, Corn Ensilage Stacks and Drainage Channels, sumps and pits inside the plant. They are also experienced in the municipal and industrial waste fields.

All regular Poly-Cide formulations are non-toxic and non-irritating.

*Write for list of Users.

VENT STACKS ODOR CONTROL


WELD IN 2" NIPPLE
COUPLING INJECTOR
VALVE CONTROLLING STEAM FLOW
APPROX 1 FT
STEAM INLET 25 TO 100 P.S.I.
NEEDLE VALVE FOR CONTROLLING POLY CIDE SOLUTIONS
STACK
TOTAL LIFT TO STEAM INLET LINE NOT TO EXCEED 15 FT
CONTAINER FOR POLY CIDE MIXTURE
USE SIZE AS REQUIRED

Typical application recommended by a Brooks' engineer for Vent Stack odor control in rendering operation.

BEFORE POLY-CIDE *by Kulow*

COSTS NO MORE

Large and small volume users report the Poly-Cides cost no more than conventional treatments. When all factors are considered (storage, handling and superior results obtained) the Poly-Cides actually cost less than ordinary methods.

Chief Chemist Works In Field

Brooks Chief Chemist, G. D. Lancaster, frequently works in the field with the engineers. He directed the development of the Poly-Cide line. Mr. Lancaster says that chemically "the Poly-Cides are liquid admixtures of Aromatics, Surfactants and other specific organic chemicals which possess odor controlling properties. Both offal water and Poly-Cide are too complex in nature to set up stoichometrical equations covering the intereaction of the two but tests in use indicate that Poly-Cide functions in a threefold manner, viz, 1) Inhibits certain odor producing biochemical reactions. 2) Converts certain odoriferous bichemical products into non-odorous derivatives. 3) Neutralizes by producing pleasant redolent conditions even when used in very low concentrations."

G. D. Lancaster

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Offices In Principal Cities

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Time to double check VANILLA *Quality*

Many manufacturers today are revising their vanilla flavor formulations, and this is the time to put the stress on quality — make a change for the better. The trend is back to real vanilla taste and the standard Alva vanillas have been doing just this job for years.

In selecting any vanilla, pure or imitation, double check it with the finest pure vanilla extract. Then buy the best you can afford.

With the changing vanilla picture it is important that you check the famous Alva vanillas. There are many to suit your needs, both pure and imitation. The Alva laboratories are eager to help. Send us your problem.

PURE VANILLA EXTRACT
The finest extract, processed for over two months.

PURE VANILLA 4X
Same quality as above, four times stronger.

VANILLA-VANILLIN
The best pure extract extended with vanillin.

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Developed on a natural vanilla bean base.

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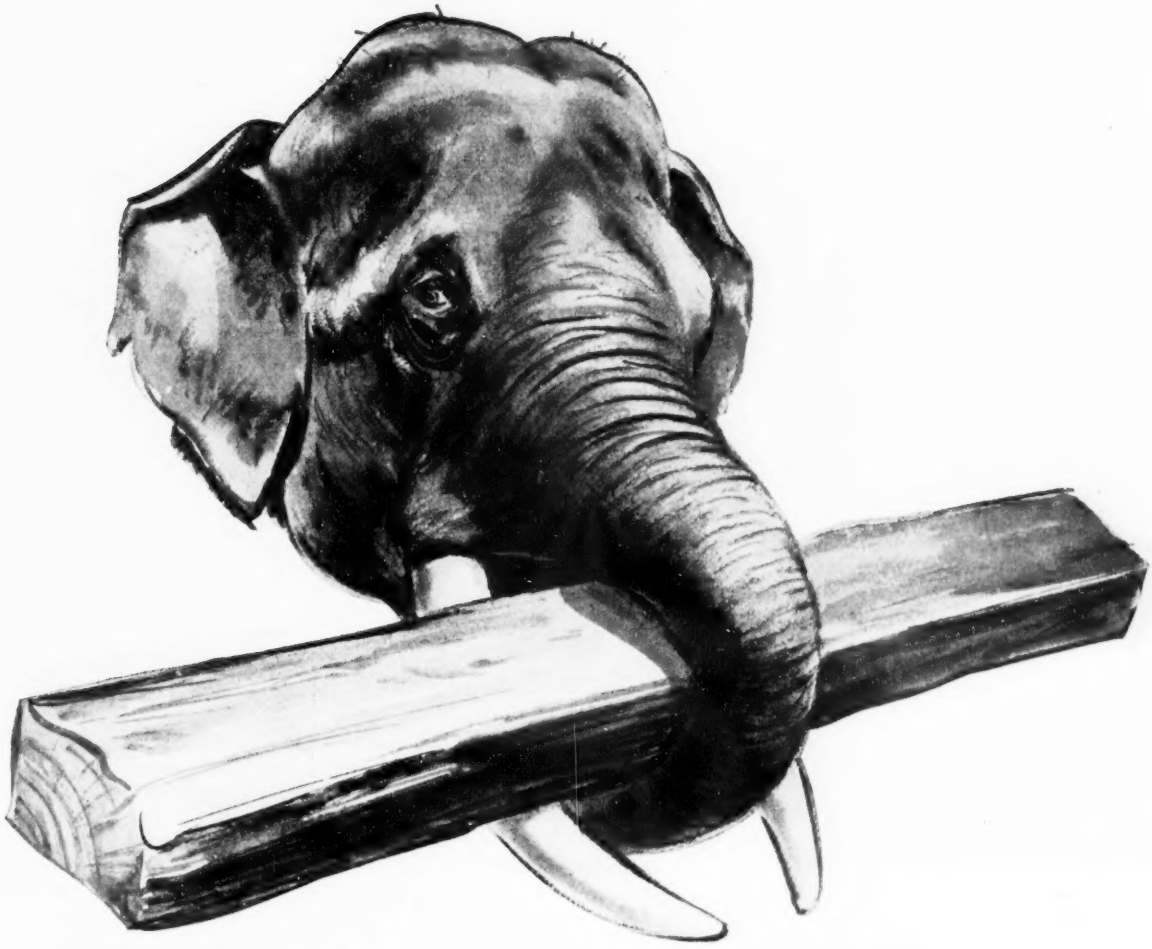
IMITATION VANILLA
A clean, brilliant flavor, fine as a chocolate stretcher.

VANILLA SUGAR (Imit.)
A dry imitation bean powder.

VAN AMERINGEN-HAEBLER, Inc.
521 West 57th Street, New York 19, New York

Alva FLAVORS

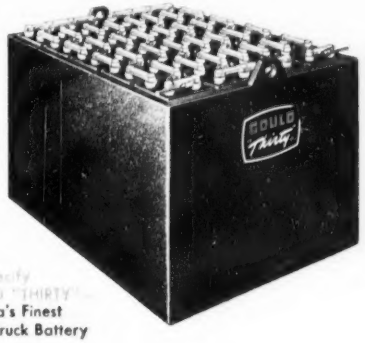
For more information, use coupon on page 159.



BRUTE STRENGTH For Handling

THANKS TO BATTERY POWER!

Battery power gives industrial trucks tremendous capacity for continuous work. Enabling trucks to operate full shift without downtime, it is the most economical, most dependable materials handling power you can buy. Battery-powered trucks are fool-proof, handle, lift and maneuver faster, are easier on the operator, run silent and fume-free, have in-service records that can't be approached! You can beat the high cost of moving materials with Gould Battery power.



Specify
THE GOULD "THIRTY"
America's Finest
Industrial Truck Battery

GOULD INDUSTRIAL BATTERIES

GOULD-NATIONAL BATTERIES, INC., TRENTON 7, N. J.

Always Use Gould-National Automobile and Truck Batteries

©1953 Gould-National Batteries, Inc.

For more information, use coupon on page 159.

Cool heads work better here. Unitaire® Conditioners run quietly and efficiently.

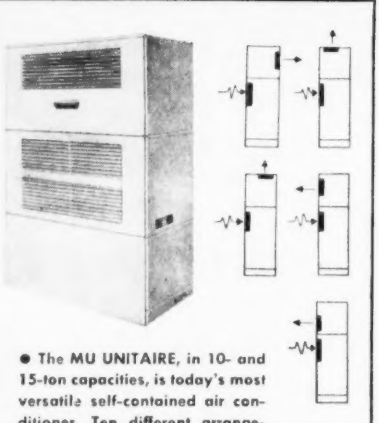
CUT SUMMER SLUMPS

WITH THIS VERSATILE AIR CONDITIONER

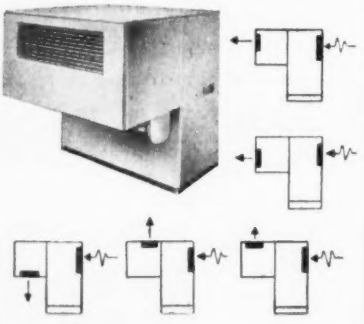
How much does one hot, sticky day cut your month's profits? Too much, when you consider employee let-down. Efficiency suffers in both office and plant. But Westinghouse Unitaire Conditioners stop these losses; keep summer output up.

The Westinghouse UNITAIRE can wring up to 31 gallons of moisture out of the air daily; keep men and machines at top efficiency. It provides greater cooling, and removes more airborne dirt. Built by Westinghouse with its proved parts, the UNITAIRE gives longer service life at lower operating costs. Maintenance is kept to a minimum.

You can get Unitaire Conditioners from stock now. Call your nearby Westinghouse Air Conditioning Distributor. Look in the Yellow Pages of your telephone directory. Or write Westinghouse Electric Corporation, Hyde Park, Boston 36, Mass.



● The MU UNITAIRE, in 10- and 15-ton capacities, is today's most versatile self-contained air conditioner. Ten different arrangements permit air discharge adaptation to job and space requirements. A special Westinghouse feature allows 50 or 100 per cent capacity operation.



WESTINGHOUSE
AIR CONDITIONING

YOU CAN BE SURE...IF IT'S Westinghouse

J-80313

How many lubricants . . .

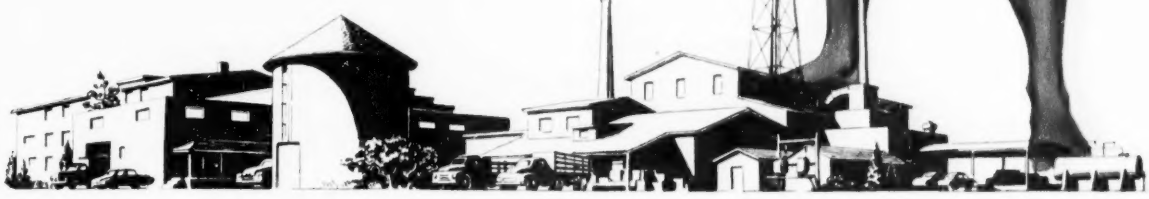
Jolly Green Giant ?

How many oils and greases to lubricate all the viners, loaders, mills, graders, washers, pumps, blanchers and picking tables at one of your giant canning plants?

"FO-FUM-FI-FEE! ONE GREASE, TWO OILS ARE PLENTY FOR ME!" Yes—the Green Giant Company's canning plant at Beaver Dam, Wisconsin, is a splendid example of how Pure Oil's multi-purpose oils and greases enable industrial users to reduce their inventory . . . simplify procedures . . . and minimize waste and error.

Write today for our free "Simplify and Save" booklet that explains how you too can start a time-saving, labor-saving, money-saving lubrication program in your plant. Address your local Pure Oil office* or Room B-35, The Pure Oil Company, Industrial Dept., 35 East Wacker Drive, Chicago 1, Illinois.

BE SURE WITH PURE *Sales offices located in more than 500 cities, including: Atlanta • Birmingham • Charleston • Charlotte • Chattanooga • Chicago Columbus • Indianapolis • Jacksonville • Madison • Memphis • Miami • Milwaukee Minneapolis • Pensacola • Pittsburgh • Richmond



THE PURE OIL PURE COMPANY, U.S.A.

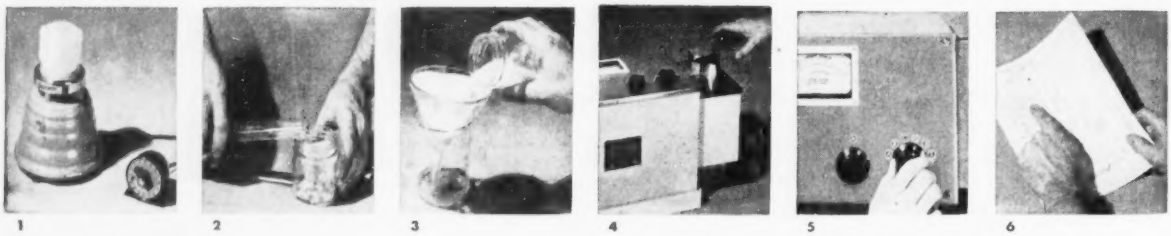
PURE OIL INDUSTRIAL LUBRICANTS

For more information, use coupon on page 159.

Every Major Corn Packer in Wisconsin Tests Maturity with a SEEDBURO STEINLITE 300 Moisture Tester!

...THEY WERE ALL ABLE TO INCREASE UNIFORMITY AND QUALITY OF PACK. YOU CAN, TOO.

EASY TO USE



1. Pulverize sample in blender
2. Blend 100 c.c. solvent with weighed portion of sample
3. Filter
4. Pour filtrate into test cell
5. Rotate dial and read meter. Temperature registers automatically
6. Convert meter reading directly to moisture content on chart, making adjustment for temperature

Takes only 5 minutes. The test can be easily made by inexperienced personnel. Once the moisture is known maturity and quality can be predicted. Many of the Wisconsin Canners cooperate with others in their area. They compare estimates of moisture content for maximum sweetness, tenderness, juiciness for each season.

●

Packers Use Steinlite 300 for Other Vegetable and Meat Products. Lima beans, peas, asparagus, pumpkin, squash and other vegetables are now being harvested for top quality pack using the Steinlite. Baby food manufacturers use the 300 LCS. Otoe Food Products Company uses the Steinlite to insure meeting rigid government specifications on G.I. Rations. Used by frozen food packers as well as canners.

ONLY $475.

IF YOU PACK CORN YOU NEED A STEINLITE

The fastest, surest, lowest cost way to improve uniformity and quality of pack. Increase your profits this year with more EXTRA FANCY corn selected by testing moisture with a Steinlite 300.

IF YOU CAN OR FREEZE OTHER VEGETABLE OR MEAT PRODUCTS LEARN ABOUT THE STEINLITE

Now the 300 LSC can help you control uniformity, increase yield and improve quality of your pack.

REPRINTS AVAILABLE Articles describing the use of the Moisture Testing for corn and other products will be sent on request. Ask for

- ☐ Here's a 5-minute tester for Sweet Corn Moisture Content.—Food Processing
- ☐ Tri-Metric Test Predicts Corn Quality.—Food Engineering
- ☐ A comparison of 3 Methods for Moisture Determination in Sweet Corn.—Food Technology
- ☐ Blue Lake Packers Use Latest Methods on Corn.—Western Canner & Packer
- ☐ Rapid Moisture Analysis Gives Results in Time to Use Them.—Food Processing and National Provisioner

Write today for complete facts. No obligation, of course.

SEEDBURO EQUIPMENT COMPANY

SEEDBURO BroMaster

734 Converse Building • Chicago 6, Ill.

Use the Steinlite 400G for Testing Moisture in Dry Products. Tests grain, corn, rice, soybeans, beans, cottonseed, flour, coffee, molding starch, dehydrated vegetables, eggs, etc. in 60 seconds. Determine quality, protects against spoilage, protect yield.

For more information, use coupon on page 159.

Speed Production, Retain Freshness...

with this heat-sealing coat of **Vinylite** BRAND resins

Data courtesy
Riegel Paper Corporation,
260 Madison Ave.,
New York, N. Y.

Take a smooth, snow-white, long-fiber paper. Give it a coating of VINYLITE Brand Resins, and you've got the makings of a first-class food package.

It heat-seals at the rate of 3,000 or more an hour. The VINYLITE Resins form a bond that holds fast—yet the consumer can tear it open without difficulty. The coating gives the paper a fine, glossy finish, enhances printing and colors, helps keep flavor and aroma inside the package.

Essentially odorless and tasteless themselves, coatings of VINYLITE Brand Resins are resistant to moisture, alcohol, temperature change, most acids, alkalies, and oils. They're tough and pliable—stick fast even where paper is creased. They add strength—reduce breaking and tearing. They won't discolor or deteriorate in contact with foods.

Besides providing a heat-seal for paper and foil, VINYLITE Brand Resins are used to line cans, drums, and closures. They offer you the properties of the VINYLITE Resins and Plastics that are used so widely throughout defense and industry. Write to Dept. PT-74 for further information on the role of VINYLITE and BAKELITE resins and plastics in the field of packaging.

Vinylite BRAND **RESINS**

TRADE MARK

BAKELITE COMPANY
A Division of
Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York 17, N.Y.

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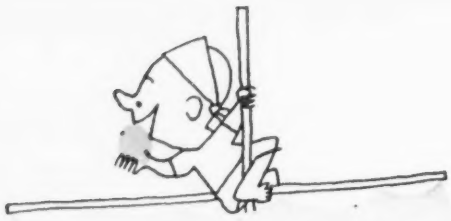
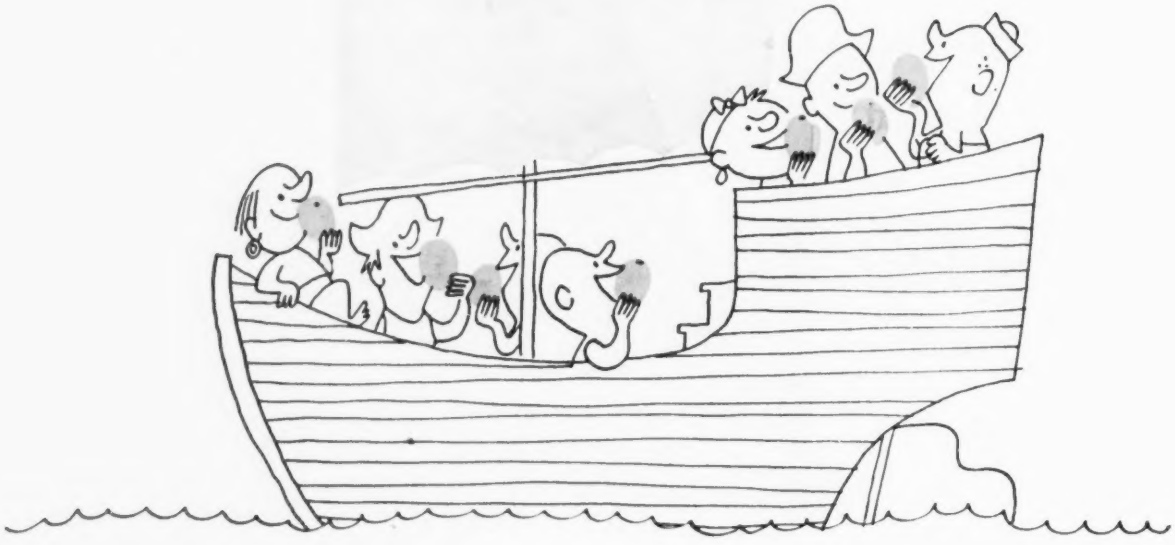


Peach Flavor came to the Western World
When St. Augustine was a baby;
Norda Peach builds nice, paying business:
You can prove that's a fact, not a maybe.



Norda Peach Flavor is popular.

People like it because it has the real taste of real peach. It has the true peach tart sweetness. It has the rich taste of peaches freshly picked and plump with goodness.

Both Norda Genuine and fine Imitation Peach Flavors can be most useful and profitable to you. Use them for superior results. They are concentrated; they go farther; they will cut your costs and keep up the quality that keeps building good business.

Send for samples of Norda Peach. That's the best way to convince yourself.

Use "A Favorite to Flavor It"
. . . . A Norda Flavor

Norda

ESSENTIAL OIL AND CHEMICAL COMPANY, INC.
601 West 26th Street, New York 1, N. Y.

CHICAGO • LOS ANGELES • SAN FRANCISCO • DALLAS • MONTREAL • TORONTO • HAVANA • LONDON • PARIS • GRASSE

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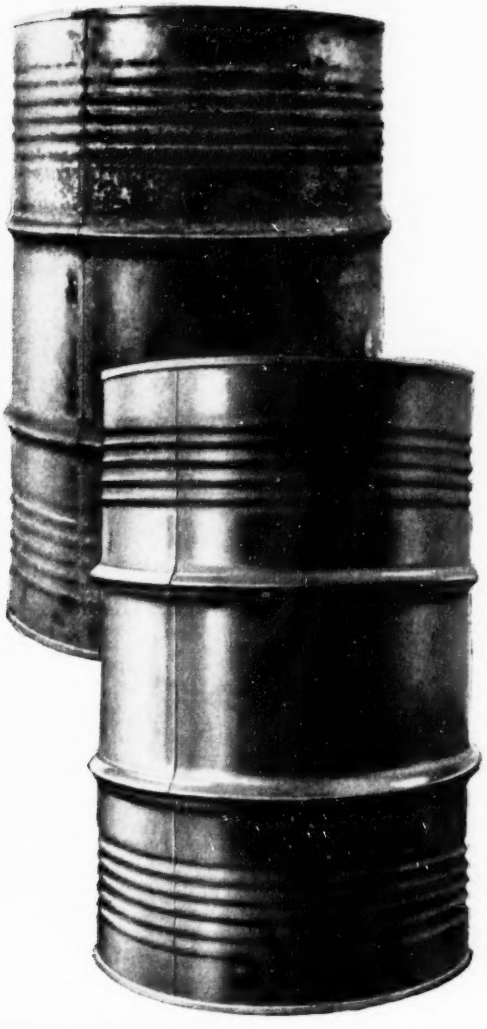
NOW! Better Steel Drums ---Better Protection for Your Products



ORDINARY PAINTED DRUM *(shown at top)* after exposure to weather for one year is badly rusted. Rust was very apparent after only *one week.*

U·S·S RUST-INHIBITED DRUM *(in foreground)* also exposed to weather for a year. There was absolutely no rust on this drum at the end of the test.

U. S. Steel Products introduces a brand-new cleaning process which completely cleans drums of contaminating materials . . . *inhibits rust formation.*

UNITED STATES STEEL PRODUCTS is pleased to announce the development of a new cleaning and finishing process that represents a significant advance in the quality of all steel drums.

The U·S·S process not only cleans drums completely of mill scale and other contaminating materials such as grease, dirt and soot, but also retards rust and corrosion. In addition, the process provides an ideal surface for finishes.

This new process cleans the drums completely . . . doesn't just cover the dirt, scale and rusting areas, leaving unprotected spots when the drum is banged around in handling. You see . . . our rust-inhibited coat is applied just prior to final assembly of the component parts . . . after the parts have been formed, and completely cleaned and descaled; there is no flaking problem.

The complete treatment consists of (1) cleaning the drum parts, completely, (2) removing mill scale and (3) applying a phosphate treatment to the steel surface, which results in a phosphate coating combining with the steel surface . . . inhibiting rust formation on both the inside and outside of the drum and forming an ideal surface for exterior and interior finishes.

* * *

United States Steel Products fabricates Stainless, Galvanized, Tinned, Painted and Decorated drums and pails. Furnished in capacities from 2½ to 110 gallons, with a variety of fittings and openings to fit your particular requirements.

"It's Better to Ship in Steel"

UNITED STATES STEEL PRODUCTS
DIVISION
UNITED STATES STEEL CORPORATION
30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.
Los Angeles and Alameda, Calif. · Port Arthur, Texas · Chicago, Ill. · New Orleans, La. · Sharon, Pa.

USS

UNITED STATES STEEL

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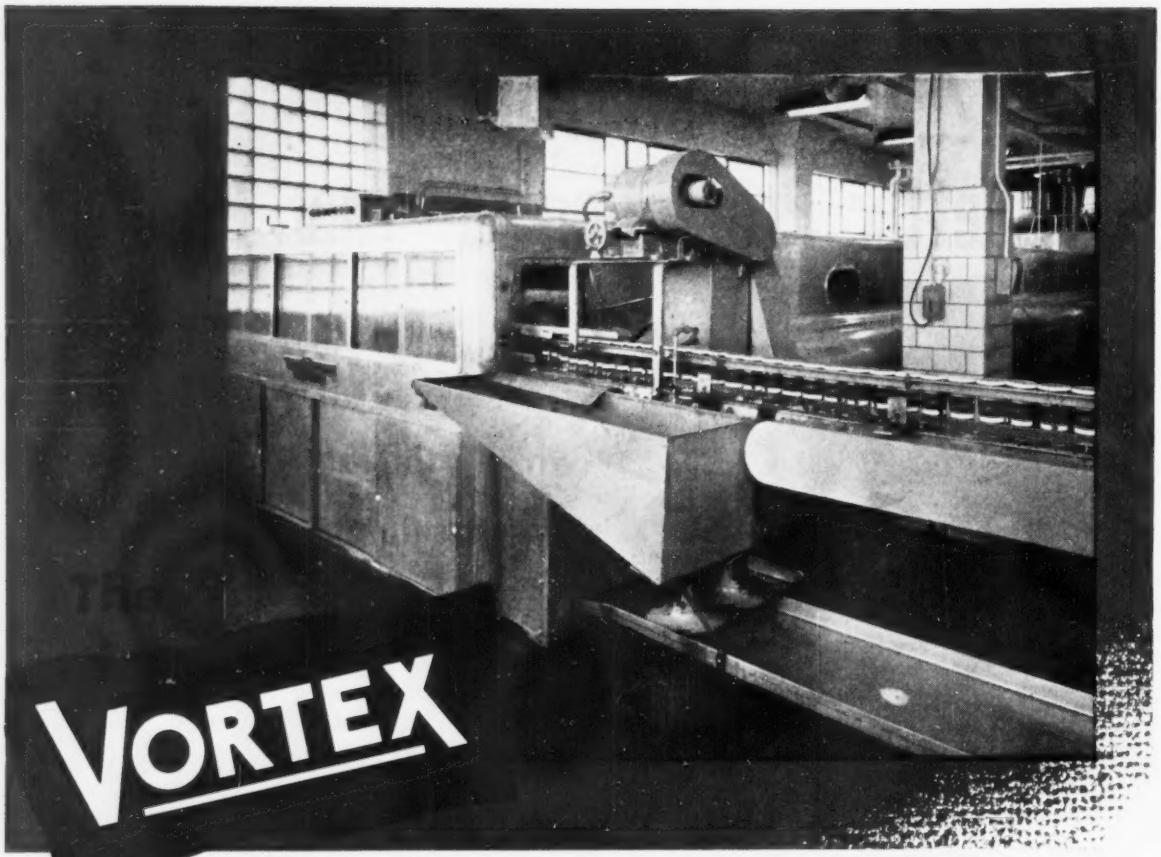

VORTEX

Efficiently Cools Preserves and Jellies for BLUE PLATE FOODS, Inc.

As in many other installations throughout the food industry, the Barry-Wehmiller "Vortex" processor is used to cool preserves and jellies in the New Orleans plant of Blue Plate Foods, Inc. Whether used as a cooler, freezer, pasteurizer or exhaust box, this versatile machine has thoroughly proven its ability to speed up production, assure highest quality of product, with extremely low maintenance and operating expense.

The famous, time-proven Barry-Wehmiller engineering refinements include the "walking-beam" conveyor, atomized spray system of heat transfer and low power hydraulic drive. The automatic, continuous operation of the "Vortex" is cutting food processing costs in a wide variety of applications throughout your industry.

For complete information on the Barry-Wehmiller "Vortex" and its many processing uses, write for bulletins and outline your requirements today.

BW BOTTLE CLEANERS · PASTEURIZERS & PROCESSORS

BARRY-WEHMILLER MACHINERY CO.

4660 WEST FLORISSANT AVENUE · ST. LOUIS 15, MO.

IN GREAT BRITAIN · BARRY-WEHMILLER MACHINERY CO. LTD. · MILL GREEN ROAD · MITCHAM JUNCTION, SURREY, ENGLAND

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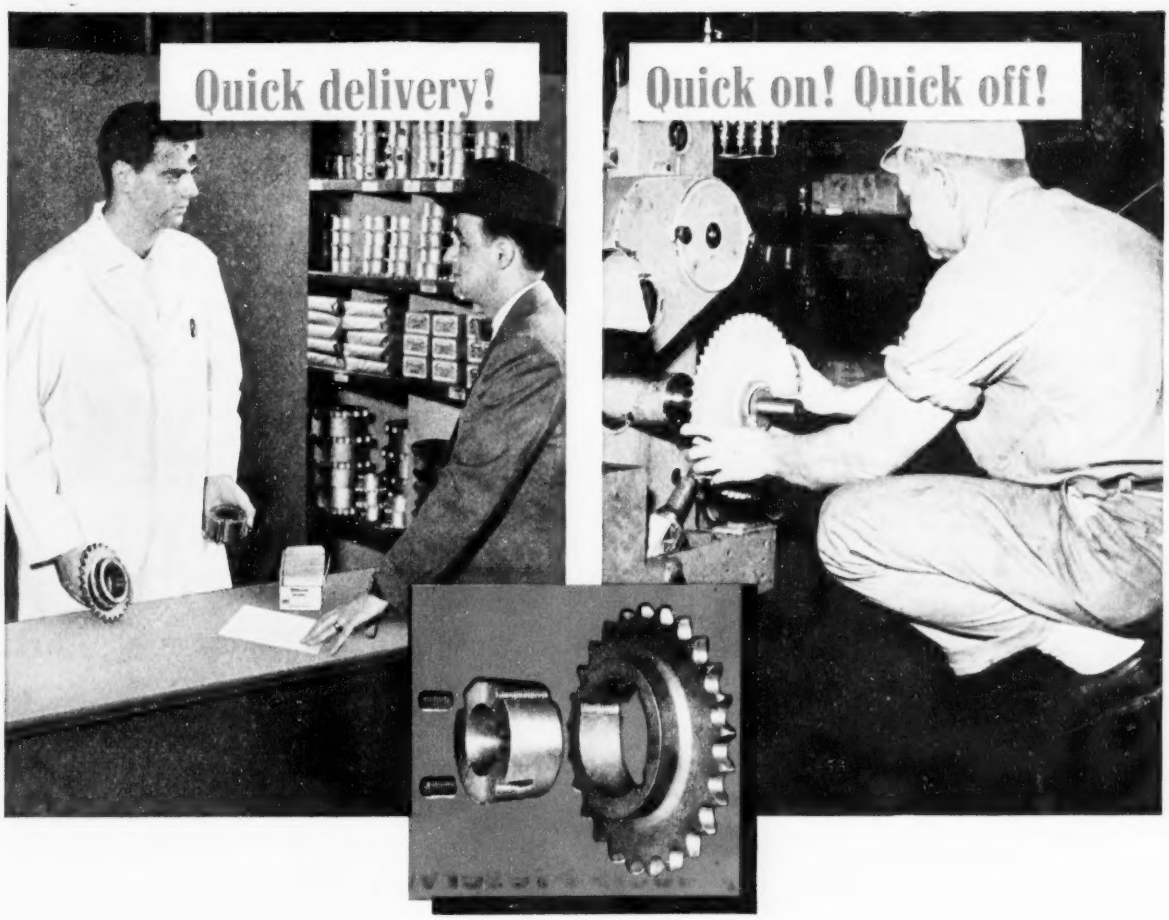
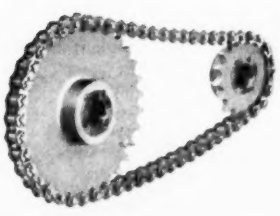


Link-Belt roller chain sprockets with taper lock bushings

HERE'S great news for users of roller chain drives! With the new Link-Belt taper lock sprocket, you don't have to fit the sprocket to the shaft. These sprockets with their taper lock bushings give you the equivalent of a shrink-fit on all standard shaft sizes.

Installation and removal are fast, simple. Set screws force and hold bushing in tapered bore of sprocket, *clamp* it tightly onto shaft. The *full length* of the bushing supports the sprocket on the shaft. Turning set screws in removal holes quickly releases it from shaft.

What's more, it's no longer necessary to wait while wheels are rebored. You can pick these sprockets right off the shelf at your nearby Link-Belt distributor or factory branch store. Available now are sizes for ½, ⅝, ¾, 1 and 1¼-in., single-width chains with other sizes to be announced. Ask for Bulletin 2449.



AN IDEAL COMBINATION:
LINK-BELT PRECISION STEEL ROLLER CHAIN & LINK-BELT SPROCKETS

LINK-BELT

ROLLER CHAIN AND SPROCKETS

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle; Scarboro, Toronto and Elmira, Ont. (Canada); Springs (South Africa); Sydney (Australia). Sales Offices, Factory Branch Stores and Distributors in Principal Cities. 13,291

For more information, use coupon on page 159.

CHECK and COMPARE the advantages of "TRI-GROOVE" FITTINGS before you convert to CLEANED-IN-PLACE lines

COMPARATIVE CHECK LIST ON CLEANED-IN-PLACE CONVERTED JOINTS

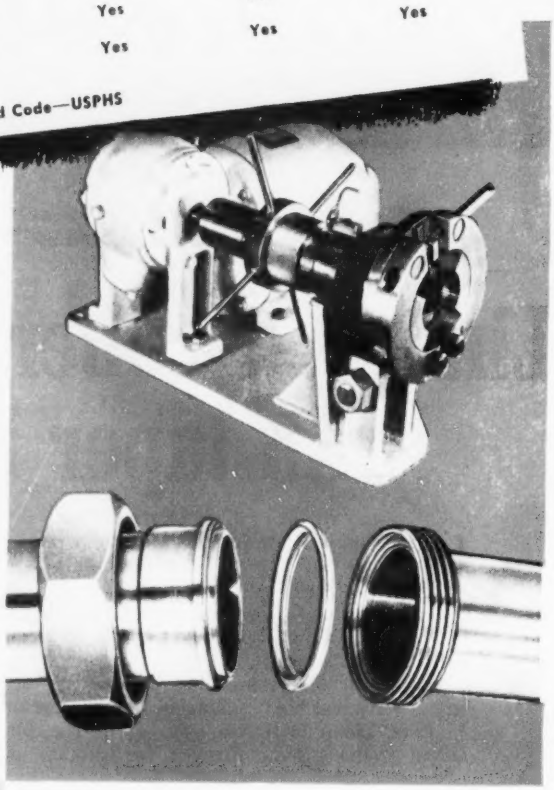
NECESSARY JOINT FEATURES	TRI-GROOVE FITTING	FITTING "A"	FITTING "B"	FITTING "C"
*Do gaskets form a substantially flush interior joint?	Yes	No	No	Questionable
*Are gaskets self-positioning?	Yes	Yes	No	Questionable
*Is the gasket surface exposure to the product at a minimum?	Yes	No	No	No
Will joint permit use of teflon gasket to best advantage?	Yes	No	Yes	No
Is the ferrule lip easy to clean by brushing?	Yes	Yes	Yes	Questionable
Do end to end dimensions of the line remain the same?	Yes	No	Questionable	Yes
Can fittings with damaged bevel seat be reclaimed?	Yes	Yes	Questionable	Yes
Is there a minimum of thread removal on female ferrule?	Yes	Yes	No	Yes
Are joints properly designed for vacuum application?	Yes	No	Yes	Yes
Are joints properly designed for high pressuers?	Yes	Yes	Yes	Yes
Are joints strong enough to withstand normal stress & strain?	Yes	Yes		

*Meets Pipeline Requirements of 1953 Milk Ordinance and Code—USPHS

"*Cleaned-In-Place*" pipelines are one of the most important developments in the dairy and food processing industry. Because of the substantial savings in labor and maintenance costs, processors have a keen desire to convert existing "take-down" lines to CIP lines.

Processors have many questions regarding the relative merits of joints made by tools being offered for use in converting present bevel seat lines to gasket seat CIP lines. To answer these questions Tri-Clover has tested the joints made by each tool and the results shown in the table above were found to be true at the time of these tests.

Before you decide on any conversion method, it will pay you to review this table and to determine for yourself the most satisfactory joint for your use.



Using either the hand-operated or motor-driven model (top view, above) the Tri-Clover Super-Speed Conversion Tool converts sanitary bevel seat fittings to Hycar gasket seat fittings, to form substantially flush, crack-free, leak-tight joints. View directly above shows the accurate, clean-cut grooves made in the fitting ends to receive the precision-molded Hycar gasket. Gasket is self-positioning on both male and female ferrules or fitting ends. Completed joint is ready for cleaned-in-place installation.

See your nearest Tri-Clover Distributor for further details.

Tri-Clover
MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

TRI-CLOVER

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

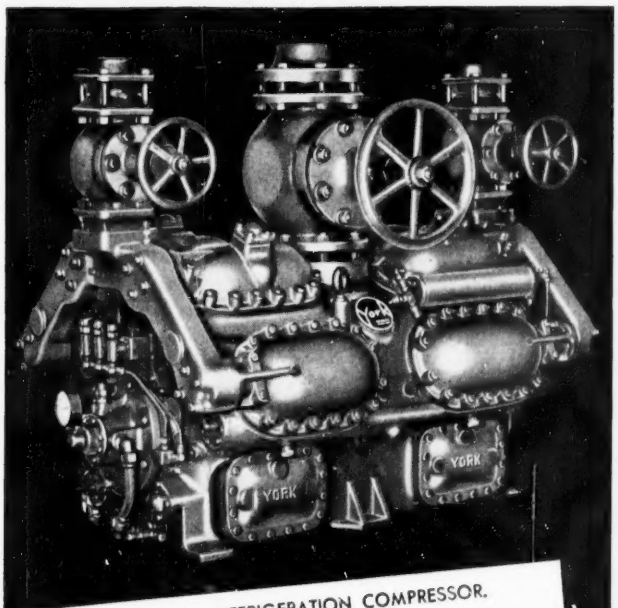
THE Complete LINE

C1253

For more information, use coupon on page 159.

YORK'S FAMOUS V/W COMPRESSOR

CAN HELP YOU BREAK THE V/OLUME P/ROFIT PARADOX!



YORK V/W REFRIGERATION COMPRESSOR.
4, 6, 8, 12, 16 cylinders.
5 to 300 tons capacity.

You'll Cut Costs With A York V/W Refrigeration Compressor

1. Low Initial Costs
2. Low Operating Costs
3. Space-Saving Compactness
4. Simplified Motors and Starting Controls
5. Low Maintenance Costs
6. Vibration-Free Operation
7. Filtered Lubrication
8. Positive Lubrication
9. Positive Shaft Seal
10. Booster and/or High-Stage Operation
11. Complete New Line

IF YOU PLAN TO PURCHASE NEW REFRIGERATION EQUIPMENT...

The "V/P Paradox" may be a new term, but the problem it describes is fast becoming a tired, old one—*production up, profits down.*

You know that the foreseeable future calls for something in addition to upping production—it calls urgently for cutting production costs! Your equipment must work harder, better, longer.

That happens to be an accurate description of a York V/W Refrigeration Compressor. It's tough and durable . . . reduces your costs—during off seasons, for example, when loads are lighter, the York V/W can save you up to 72% power costs . . . is low in upkeep because every wearable part is easily and quickly replaced.

It's compact, too, unusually compact . . . needs no special foundations for upper floor mounting. And its complete flexibility lets you schedule work-hours and manpower more profitably. It will work well and hard and long for you.

See your York representative soon. No obligation, of course. Or you can write directly to York Corporation, York, Pennsylvania.

YORK REFRIGERATION AND AIR CONDITIONING

HEADQUARTERS FOR MECHANICAL COOLING SINCE 1885

York refrigeration and air conditioning

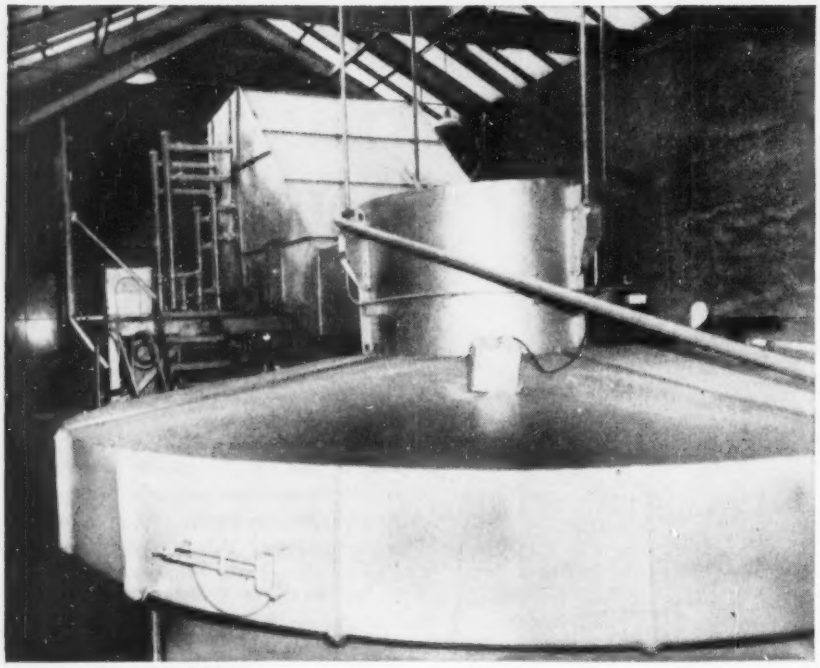
For more information, use coupon on page 159.

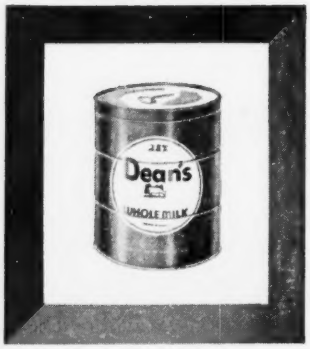
ALL but 2% of Moisture Extracted

from Various Milk Products

by AUTOMATICALLY-CONTROLLED GAS DRYER

at DEAN MILK COMPANY





20′ diameter stainless steel dryer for powdered milk production, with Gas-fired Air Heater in the background. In the round portion is located the nozzle from which fluid milk is sprayed into the hot air stream under high pressure.

POWDERED MILK another of the long list of important food products processed in Gas-fired Equipment, requires precise control of temperature and volume of heated air to dehydrate fluid milk. In a pilot plant, which also utilized GAS for heat processing, Dean Milk Company engineers developed the method of atomizing milk at high-pressure into a turbulent stream of heated air.

The success of the pilot plant guided these engineers in the construction of a Gas-fired Extractor which delivers powdered milk, ready for packaging, with 2% or less residual moisture.

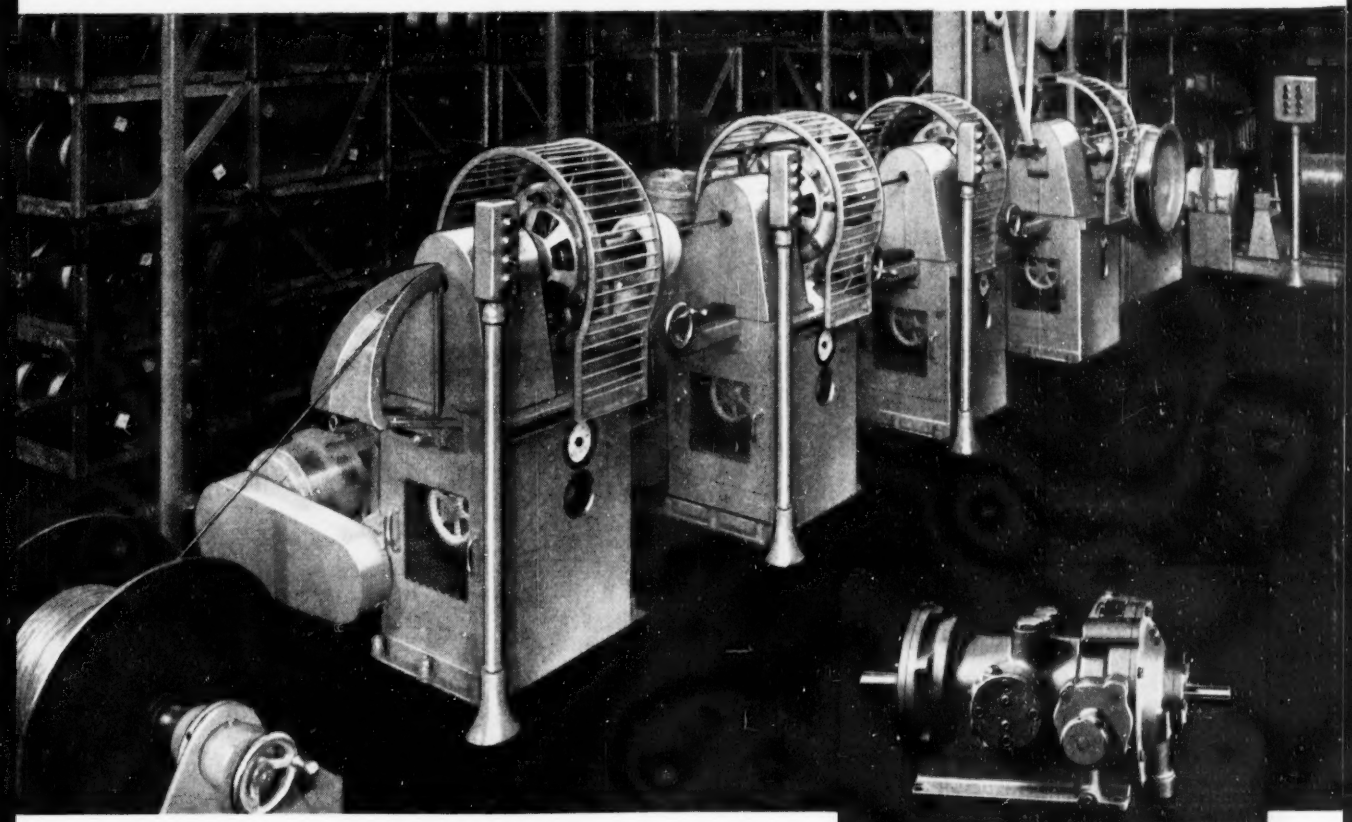
Because powdered milk must meet the same sanitation standards which health authorities have set up for fluid milk Dean Milk Company observes the strictest standards of quality control and cleanliness. The use of GAS, with its precise controllability and inherent cleanliness, aids in both of these—and in reducing the complexity and costliness of equipment, as well.

The scope of GAS applications for food processing is so broad that you will find it worthwhile to examine your present and future needs for fuel in any types of operation—ask your Gas Company Representative for assistance.

AMERICAN GAS ASSOCIATION • 420 LEXINGTON AVE., NEW YORK 17, N. Y.

For more information, use coupon on page 159.

MACHINE DESIGN AT WESTERN ELECTRIC



Its use of Oilgear Fluid Power

Western Electric Company, manufacturing unit of the Bell Telephone System, originates, designs and builds many of the special machines it uses in its own manufacturing processes. It also maintains unceasing pressure to improve upon machines already in operation, for optimum performance, for better product, for lower costs, for freedom from trouble.

Its use of Oilgear Fluid Power Drives and Transmissions has been increasing because, in the words of their engineers, Oilgear enables them among other things to synchronize many machine components easily and economically. A good example of all these points is the "short haul" video cable wrapping machine pictured above.

This machine was designed and built by the company's own men some years ago. For optimum performance, the speed of the heads should be easily and independently variable and the direction of rotation instantly changeable because the lay and pitch of the wrappings must be varied according to the requirements of the run. Moreover, the inside contour of the tube formed by the wrapping should be smooth and uniform so as to avoid setting up echo waves that interfere with transmission and vitiate signal strength.

Because of these requirements, a new drive was installed something over 4 years ago. A line shaft drives five Oilgear Fluid Power Transmissions, one at each machine head and the capstan.

The results were these: uniformity and control of tension are so good, the machine runs at 4 times its former machine speed; it is easy to vary speed and direction of rotation of each individual head; eccentric heads gave way to concentric heads, and supply spools are now loaded to full capacity instead of ¼th to ⅛th as before; the machine is stopped less frequently for loading. Maintenance on the former drive was involved and frequent—on the Oilgear equipment it has been simple and negligible.

There is some reason to suspect that Oilgear Fluid Power with its wide range of advantages may solve some of *your* machine design problems and make the results very pleasing and profitable. Why don't you really find out? THE OILGEAR COMPANY, 1580 West Pierce Street, Milwaukee 4, Wisconsin.

OILGEAR

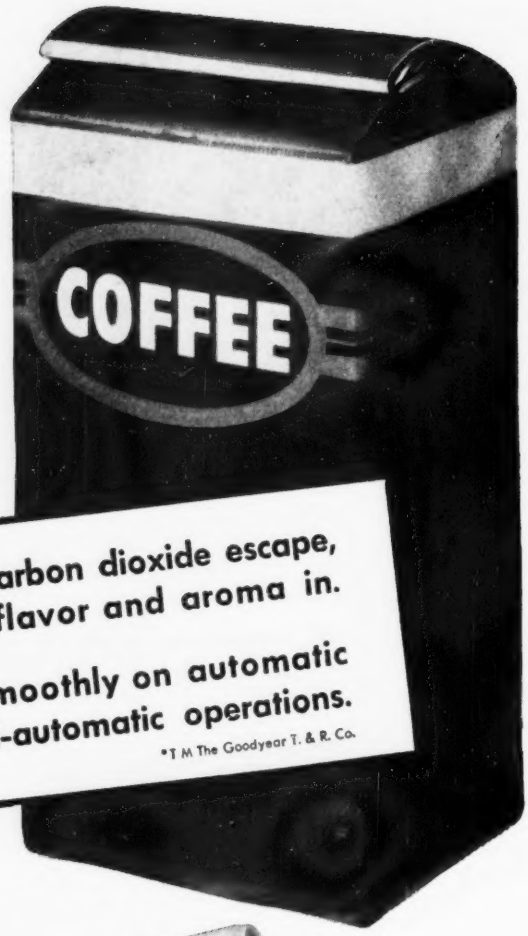
OILGEAR

Keep coffee fresh 3 times longer with Flav-O-Tainer!

For sound reason, many of the best names in coffee now pack their freshly-ground product in Betner Flav-O-Tainer bags.

These economical bags are engineered for coffee. Thanks to their PLIOFILM* lining and hermetically-sealed inner seams, they keep coffee vacuum-fresh. That's good for roasters and packers, good for distributors and merchants, and wonderful for the consumer.

Let us show you how your design will look on a Flav-O-Tainer bag. And ask about Continental's Tailor-Made Package Service which makes available to you the finest in individualized engineering and research facilities.



← PLIOFILM* liner lets carbon dioxide escape, keeps oxygen out, flavor and aroma in.

← BETNER bag fills smoothly on automatic high-speed or semi-automatic operations.

*T M The Goodyear T. & R. Co.

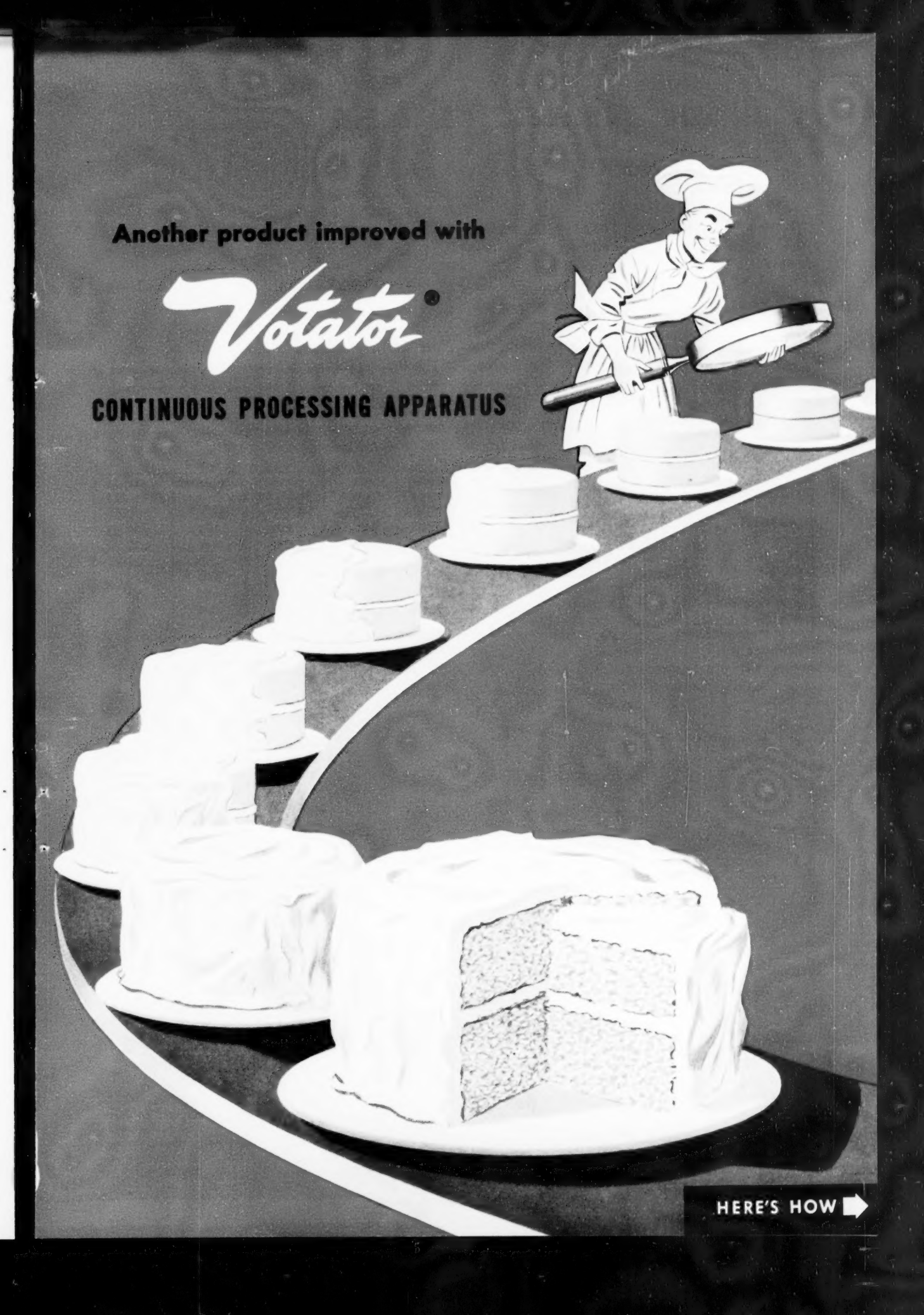
BETNER

Division

CONTINENTAL CAN COMPANY, INC.

DEVON, PENNSYLVANIA

Plants also located in RICHMOND, VA., PARIS, TEX., BEAUMONT, TEX., APPLETON, WIS. and LOS ANGELES, CALIF.


Another product improved with
Votator®
CONTINUOUS PROCESSING APPARATUS
HERE'S HOW

Continuous processing improves product quality

SAVES $6500 A YEAR AT FARM CREST BAKERIES

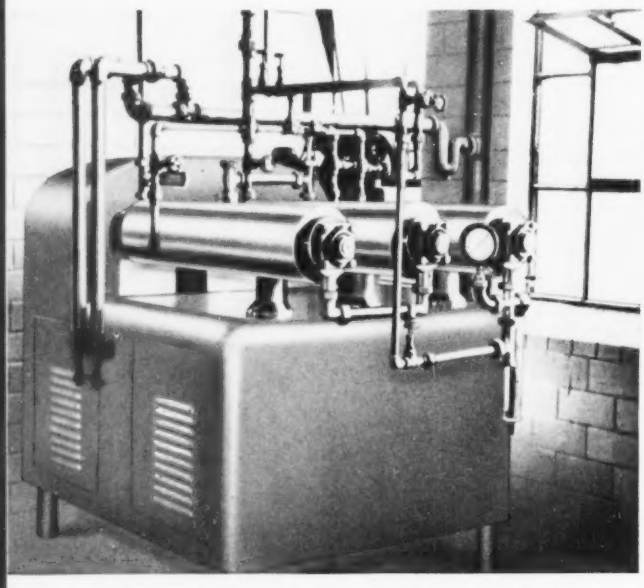
THIS new application of VOTATOR Heat-transfer Apparatus—mixing and whipping cake batters—is now saving Farm Crest Bakeries of Detroit $6500 a year in direct labor alone. The pre-batching operation has been eliminated, and skilled operators for mixing are no longer required. Oven capacity has increased 10% since the batter requires less baking time.

A second major advantage of this installation is improved *product quality*. The density of the batter—a critical factor in quality—is now controlled exactly despite variations in weather or shop conditions. This results in better appearance and longer shelf life.

FACTS AND FIGURES ON CONTINUOUS BATTER MIXING

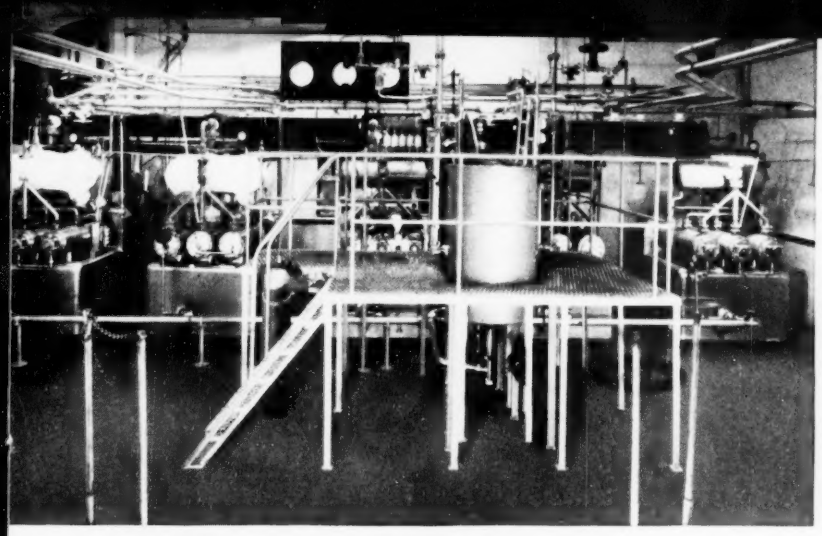
Normal production rate is 1500 pounds per hour. Output may be varied between 900 and 2400 pounds per hour, depending on pump speed and type of batter. The following are different type batters produced at Farm Crest Bakeries. These data had to be fitted to formulation for optimum results. Note similarity among various batter families.

Variety of Cake	Premix Temp. (Deg. F.)	Temp. Out of 1st Tube (Deg. F.)	Final Batter Temp. (Deg. F.)	Back Pressure (Psi.)	Density (Weight Per Gal. Lb.-Oz.)	Air Flow Reading	Motor Load (Amp., 27.2 Maximum)
Gold layers	65-70	75	85	60	6-4	1.75	22
Sponge Cake	65-70	80	90	50	5-2	3.00	23
Short Cake	65-70	80	92	50	5-2	2.00	23
Jelly Roll	65-70	80	90	50	5-0	3.50	24
Gold cup cakes	70-75	85	98	50	6-8	1.00	27
Devils Food Slice	70-75	85	100	50	5-4	1.50	25
Devils Food cup cakes	70-75	85	104	45	6-12	0.75	26



CAKE BATTER . . . of perfect density is mixed and whipped by this VOTATOR Continuous Mixer. The equipment is completely sanitary, and can be cleaned quickly by simply running hot water through the input piping. Downtime between runs is held to a minimum.

MARSHMALLOW MIX . . . is cooled, whipped, and aerated by another efficient installation at Farm Crest. The closely controlled, closed-system operation assures a smooth textured finished product—light and uniform. Many such installations of VOTATOR Heat-transfer Apparatus for processing marshmallow have produced savings up to 66% in labor cost, and up to 50% in floor space. Units in capacities from 350 to 1800 pounds per hour are available.



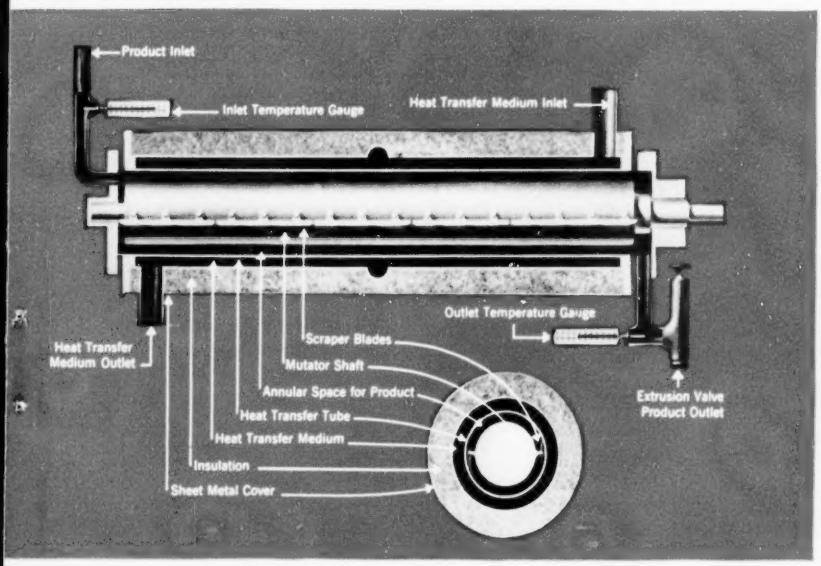
NO OPERATORS IN THE PICTURE!

These five VOTATOR Slush-freezing Units at Minute Maid Corporation chill orange concentrate prior to packing and freezing. The juice is pumped from blending tanks at approximately 70°F and is chilled rapidly by the VOTATOR Slush-freezing Units to 17°F. At this stage, the concentrated juice resembles a sherbet-like ice, with ice crystals distributed throughout its mass. The partially frozen juice is then pumped to filling machines where it is packed. The units operate automatically, and require only casual supervision. In addition to reducing labor, the installation saves floor space by eliminating the need for large cold-wall tanks for preliminary cooling.

The sales appeal of frozen concentrates is based on protection of delicate flavor and vitamin content. Processing in fully enclosed system excludes air, thus minimizing oxidation and preventing contamination.

What's YOUR Processing Question?

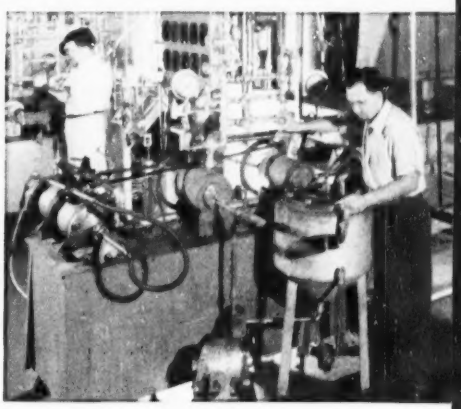
Continuous processing with Votator Heat-transfer Apparatus is improving production efficiency and product quality for a wide variety of food products. Call on Girdler for complete process design, engineering and construction service.



HEART OF THE CONTINUOUS PROCESSING SYSTEM

The VOTATOR Heat-transfer mechanism is the most effective application of basic heat-transfer theory yet devised. It processes a maximum volume of material per unit area of heat-transfer surface.

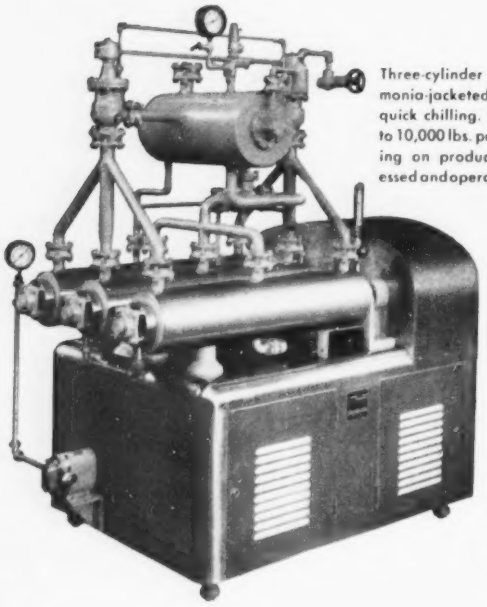
The material to be processed is pumped through a narrow, annular passage, is heated or cooled in seconds through contact with the heat-transfer tube. Revolving scraper blades maintain a clean heat-transfer surface and provide simultaneous agitation and mixing. The completely enclosed system provides greater protection against contamination than otherwise possible.



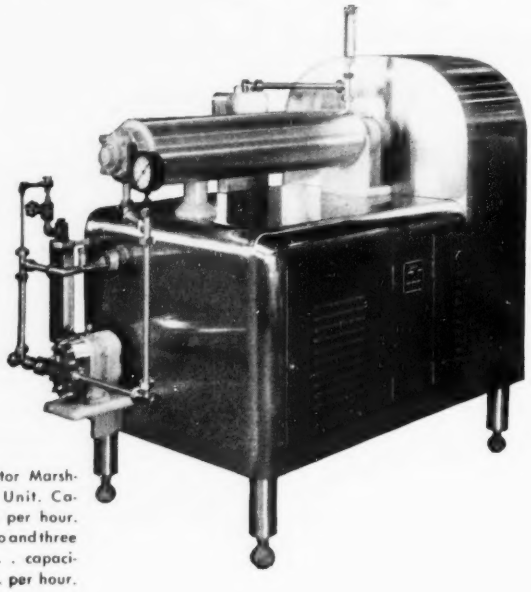
BROAD PROCESS EXPERIENCE

Outstanding Girdler chemists and engineers in the fields of food technology and oil processing have developed distinctive processes and apparatus for many applications in the food industry. Use Girdler's broad experience to improve *your* products and processing efficiency.

Two of many types of Votator processing apparatus used in the food industry



Three-cylinder unit with ammonia-jacketed cylinders for quick chilling. Capacity 2,000 to 10,000 lbs. per hour, depending on product being processed and operating conditions.



One cylinder Votator Marshmallow Processing Unit. Capacity 500 pounds per hour. Also available in two and three cylinder models . . . capacities up to 1,800 lbs. per hour.

GET THE FULL STORY TODAY!

This 32-page book gives you complete information on the application of VOTATOR Heat-transfer Apparatus. It contains a 12-page technical section with valuable reference data and charts. Write for your free copy today.

Do you have a similar processing operation?

FOOD PRODUCTS	FUNCTION OF VOTATOR APPARATUS
Marshmallows	Cooling, Whipping, Aerating
Cake Batter	Mixing
Cream Style Corn	Sterilizing and Cooling
Dog Food	Cooking, Sterilizing and Cooling
Chocolate Milk Drink	Sterilizing and Cooling
Edible Starch (For Salad Dressing)	Cooking and Cooling
Pie Filling	Cooking, Pasteurizing and Cooling
Strained Food	Sterilizing and Cooling
Soup	Sterilizing and Cooling
Lard	Chilling and Plasticizing
Margarine	Continuous Manufacture
Shortening	Chilling and Plasticizing
Sweetened Condensed Milk	Cooling and Crystallizing of Sugars
Invert Syrup	Cooling and Crystallizing of Sugars
Eggs	Pasteurizing and/or Chilling
Concentrates, Fruit Juices and Purees	Slush Freezing
Juice Concentrates	Enzyme Inactivation, Sterilization, Cooling

THE GIRDLER CORPORATION
224 East Broadway, Louisville 1, Kentucky

Please send booklet describing Continuous Processing

Name

Position

Company

Address

City *State*

The **GIRDLER** Corporation

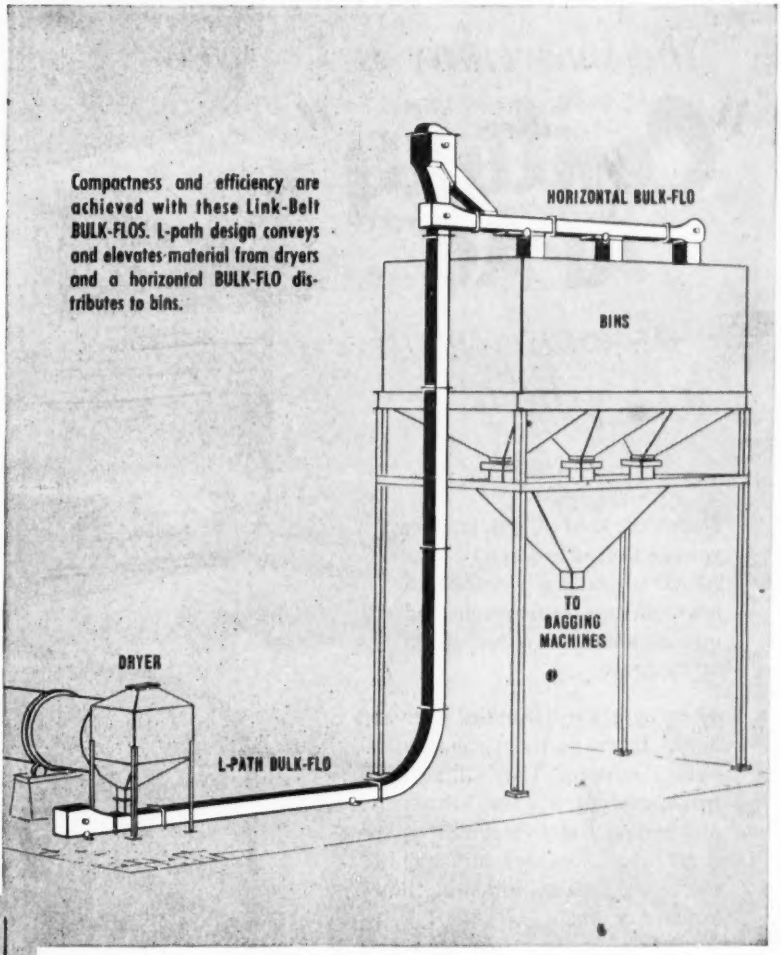
LOUISVILLE 1, KENTUCKY

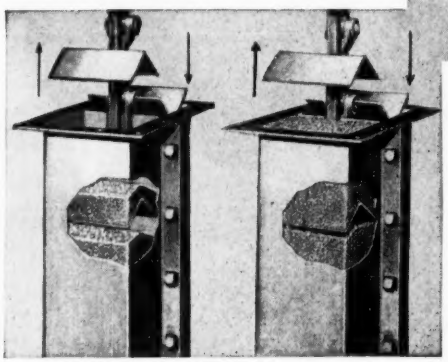
VOTATOR DIVISION: New York, Atlanta, Chicago, San Francisco

With Bulk-Flo you feed, convey, elevate in one compact, fully enclosed assembly

Get lower handling costs on a wide range of materials

YES, a single BULK-FLO can move material horizontally, on an incline, vertically or many combinations of these. That means fewer units . . . less space required . . . lower costs for most handling requirements. What's more, solid flights provide positive movement of a wide variety of materials—fully or partially loaded. And the individual "compartments" insure gentle handling. Ask your nearby Link-Belt office for further information or send in coupon for Book 2475.


Compactness and efficiency are achieved with these Link-Belt BULK-FLOS. L-path design conveys and elevates material from dryers and a horizontal BULK-FLO distributes to bins.
HORIZONTAL BULK-FLO
BINS
TO BAGGING MACHINES
DRYER
L-PATH BULK-FLO



Fully or partially loaded, BULK-FLO provides positive, gentle movement of material. Unlike conventional designs, BULK-FLO's capacity can be varied by regulating feed to meet demand changes.

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BULK-FLO FEEDERS, CONVEYORS, ELEVATORS 13.205

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities.

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Address your nearest office

Please send me immediately a free copy of your 28-page BULK-FLO Book 2475.

Name_____

Firm_____

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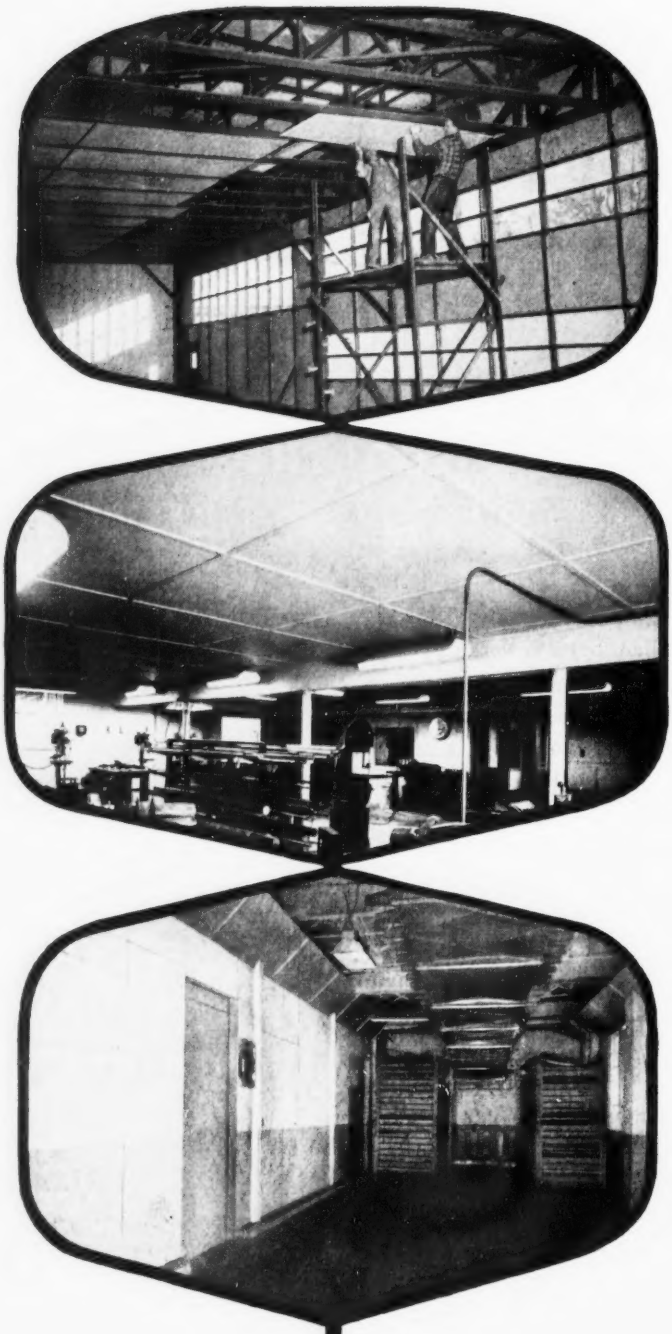
For more information, use coupon on page 159.

INSIDE OR OUTSIDE,
WALLS OR CEILINGS

the smart buy is

"Century" APAC

asbestos-cement sheets



Here's the kind of building economy you can't afford to pass up! "Century" APAC sheets offer you the means to low-cost, trouble-free walls and ceilings on almost any type of building or structure.

These light, easily-handled sheets are made from portland cement and mineral asbestos. They will not burn, rot, or corrode, and they are impervious to insects and vermin. They take decorative colors well, although they never need paint for protection—indoors or out.

Rooms finished with "Century" APAC sheets are clean, attractive places in which to work. Structures sided with this versatile material have a trim, modern, efficient look. Best of all they *stay* that way, for "Century" APAC needs virtually no maintenance—ever!

Your K&M distributor can tell you more about this product and the other types of "Century" asbestos-cement sheets. See him soon! Or write directly to us.

Nature made Asbestos . . .
Keasbey and Mattison has made
it serve mankind since 1873

K&M best in asbestos

KEASBEY & MATTISON
COMPANY • AMBLER • PENNSYLVANIA

For more information, use coupon on page 159.

In many installations in the Food Processing Industry, ordinary steel valves seem adequate — for awhile. But later on corrosion takes its toll. Excessive maintenance and replacement begins.

When you install (or replace with) Powell Stainless Steel Valves, their much longer life and lower maintenance will repay, many times over, the slight differential in the cost of these valves.

The Wm. Powell Co. Cincinnati 22, Ohio

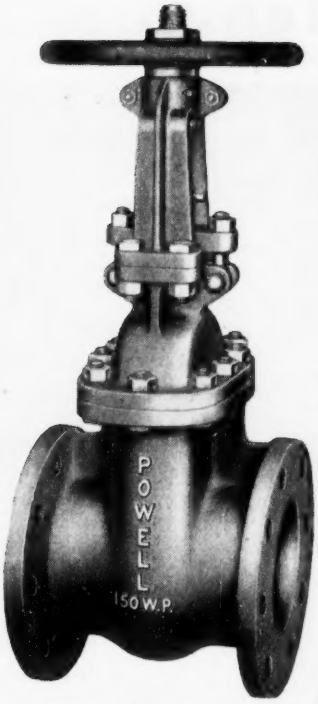


Fig. 2453-G — Large 150-pound Stainless Steel O. S. & Y. Gate Valve. Precision-fitted, accurately guided interchangeable solid or split wedge. Separable yoke arms in sizes 5" to 30", incl.

Fig. 1832—200-pound Stainless Steel Gate Valve with screwed-in bonnet. Sizes ¼" to 2", incl.

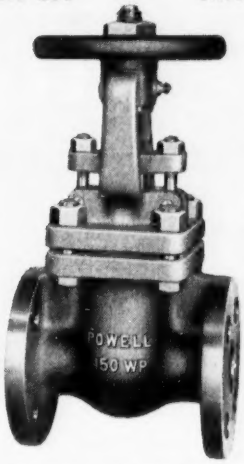


Fig. 2491 — 150-pound Stainless Steel O. S. & Y. Gate Valve with either solid or split wedge. Sizes ¼" to 2", inclusive. Also available with screwed ends.

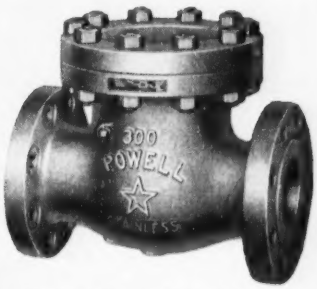
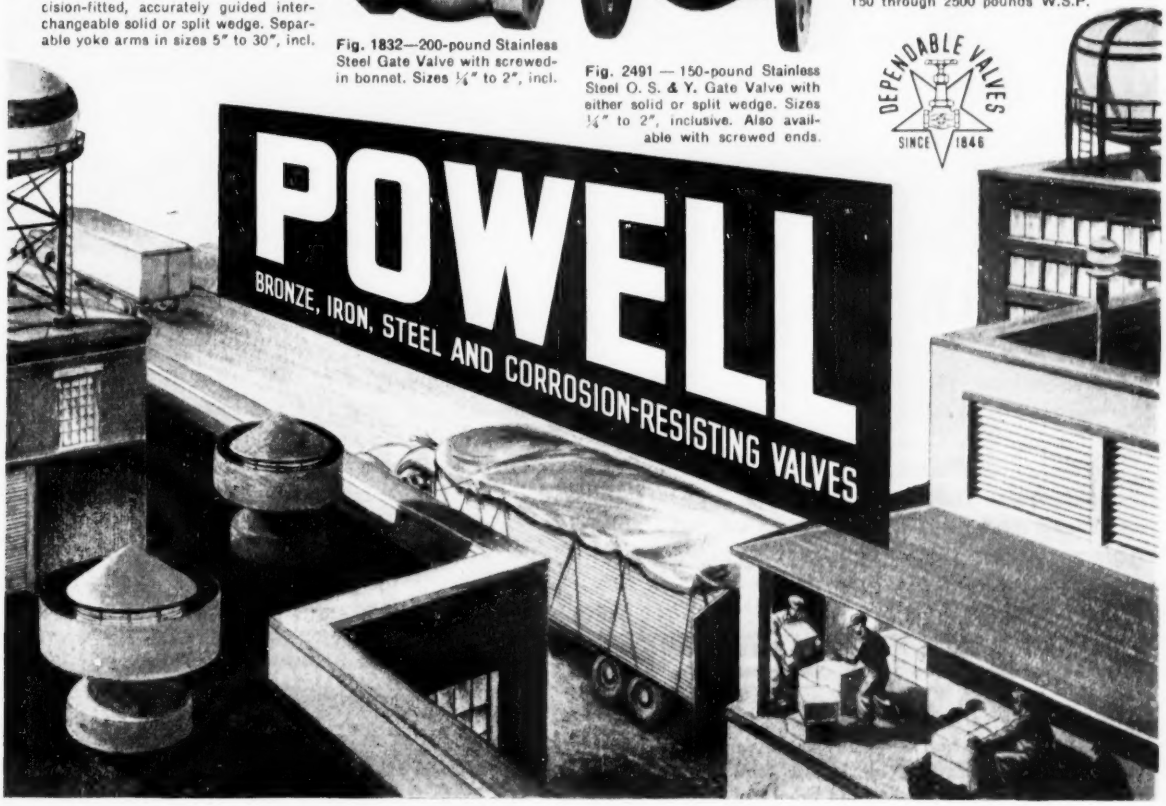


Fig. 3061 S. S. — 300-pound Stainless Steel Swing Check Valve. Made from a heavy steel valve pattern, it conforms to A.S.A. and A.P.I. Steel Valve Standards. These valves are available for 150 through 2500 pounds W.S.P.

DEPENDABLE VALVES SINCE 1846



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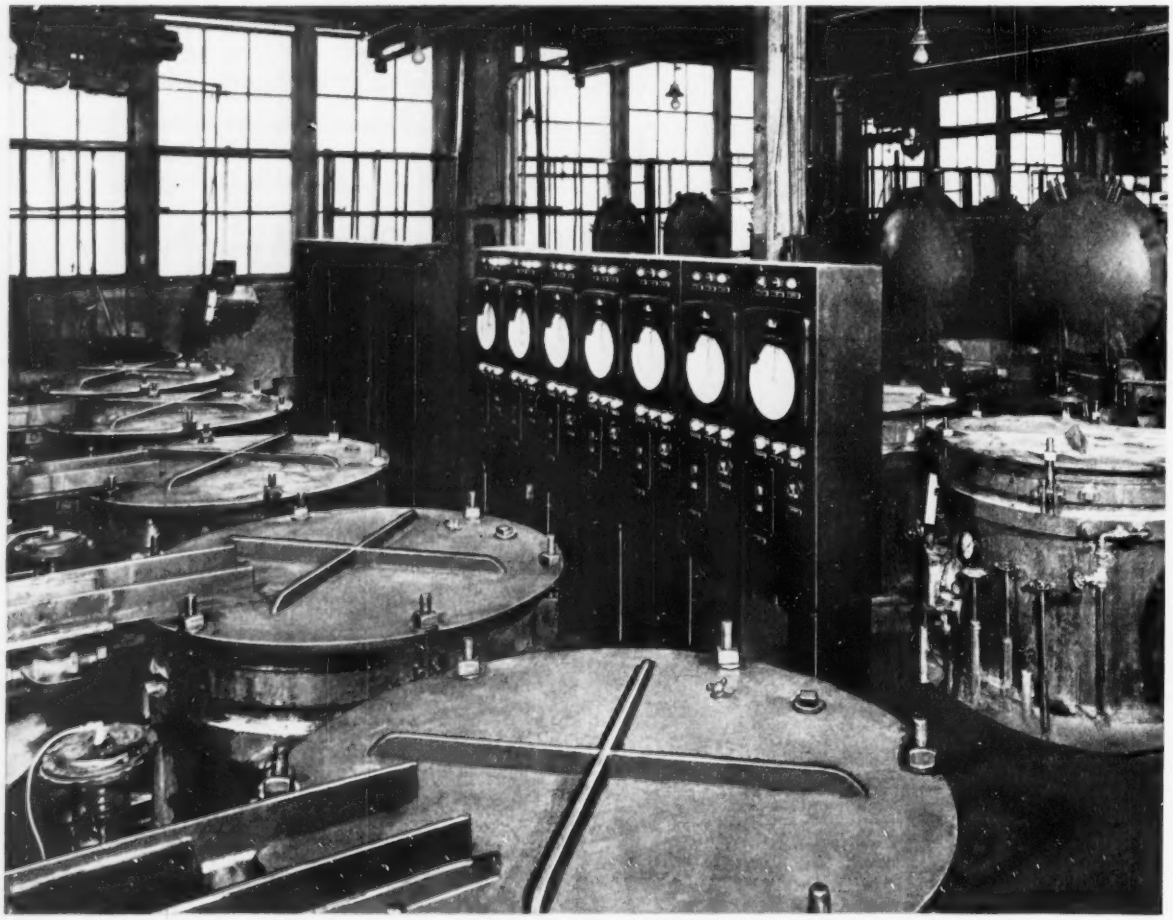
Stokely-Van Camp

improves retort operation...



...with Foxboro Automatic Control

"More uniform product at higher quality" and "economies in operation" are advantages reported by Stokely-Van Camp as a result of the recent installation of Foxboro Instruments at its Indianapolis plant.

These modern retort controllers not only give greater accuracy of control, but also provide time-saving flexibility of use. A flip of a switch is all that's needed to adapt the processing for large cans, small cans, or glass.

Foxboro Systems offer you the most modern developments in measurement and control for *any* food process. Write for detailed information on your problem, or ask a Foxboro Engineer to call.

THE FOXBORO COMPANY, 307 NEPONSET AVE., FOXBORO, MASS. U.S.A.

FOXBORO
REG. U. S. PAT. OFF.

Instruments that improve product uniformity

FACTORIES IN THE UNITED STATES, CANADA AND ENGLAND

Turning oven turns out better turnovers

...with help of TIMKEN® bearings

WHEN it comes to turning a revolving tray oven smoothly, evenly—to help it turn out the widest range of variety baking—there's nothing surer than Timken® tapered roller bearings on the drive. That's why Century Machine Company uses Timken bearings in the reduction drive worm of their revolving tray ovens.

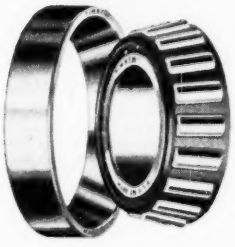
As the oven revolves, the worm and the bearings are subjected to heavy thrust loads. Starting and stopping of the oven adds greater loads, too. But thrust loads are no problem with Timken bearings. Neither are radial loads. That's because the tapered construction of Timken bearings lets them carry both radial and thrust loads in any combination!

In case of power failure, the oven can be turned by hand crank. And even then, Timken bearings make the turning easier because of their incredibly smooth surface finish and true rolling motion that practically eliminate friction.

Want dependable, low-cost performance in the machines you build or buy? Then make sure they're equipped with Timken bearings. Always look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.

THE CENTURY MACHINE COMPANY uses Timken tapered roller bearings on the reduction drive worm of their revolving tray ovens to assure smooth, even turning and long, trouble-free operation.



TIMKEN

TAPERED ROLLER BEARINGS

HOW YOU BENEFIT FROM A BEARING YOU PROBABLY DON'T USE!

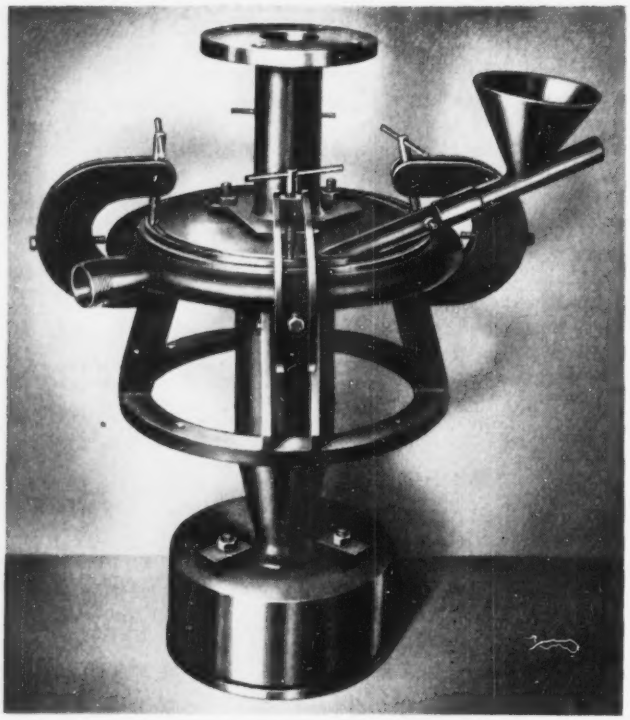
The new Timken "00" bearing—with maximum runout tolerance of a mere 75 millionths of an inch—is used only for applications requiring extreme accuracy. But it helps users of standard Timken bearings, too. That's because many techniques developed to give the "00" its super accuracy are being used to raise the precision of *all* Timken bearings!

NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION

For more information, use coupon on page 159.

Announcing the STURTEVANT

MICRONIZER*



Pulverizing Machine for Reducing Materials to Micron Sizes

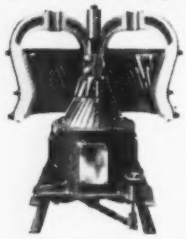
A fluid jet pulverizing machine, the Sturtevant *Micronizer* speeds reduction of materials to low micron sizes. These jet mills are especially applicable in fields where a particle size in microns is desired.

Sturtevant *Micronizer* mills are used throughout industry for reducing non-metallic and metallic minerals and ores, pigments, insecticides, fungicides, pharmaceuticals, plastics, dyes, and numerous other organic and inorganic products.

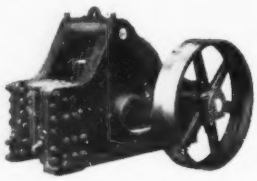
Sturtevant *Micronizer* pulverizers are available in many sizes and capacities. Write for information.

Other Sturtevant Pulverizing Equipment for Rapid Reduction of Materials...

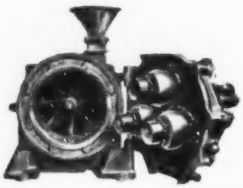
Especially Applicable for Initial Grinding of Products for the Micronizer Mill



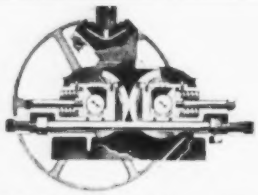
ROTARY FINE CRUSHERS for intermediate and fine reduction (down to ¼"). Open door accessibility. Soft or moderately hard materials. Efficient granulators. Excellent preliminary Crushers preceding Pulverizers.



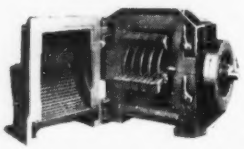
JAW CRUSHERS for coarse, intermediate and fine reduction of hard or soft substances. Heavy or light duty. Cam and Roller action. Special crushers for Ferro-alloys. Several types, many sizes.



RING-ROLL MILLS for medium and fine reduction (10 to 200 mesh), hard or soft materials. Very durable, small power. Operated in closed circuit with Screen or Air Separator. Open door accessibility. Many sizes. No scrapers, plows, pushers, or shields.



CRUSHING ROLLS for granulation, coarse or fine, hard or soft materials. Automatic adjustments. Crushing shocks balanced. For dry or wet reduction. Sizes 8 x 5 to 38 x 20. The standard for abrasives.



SWING-SLEDGE MILLS for coarse and medium reduction (down to 20 mesh). Open door accessibility. Soft, moderately hard, tough or fibrous substances. Built in several types and many sizes.

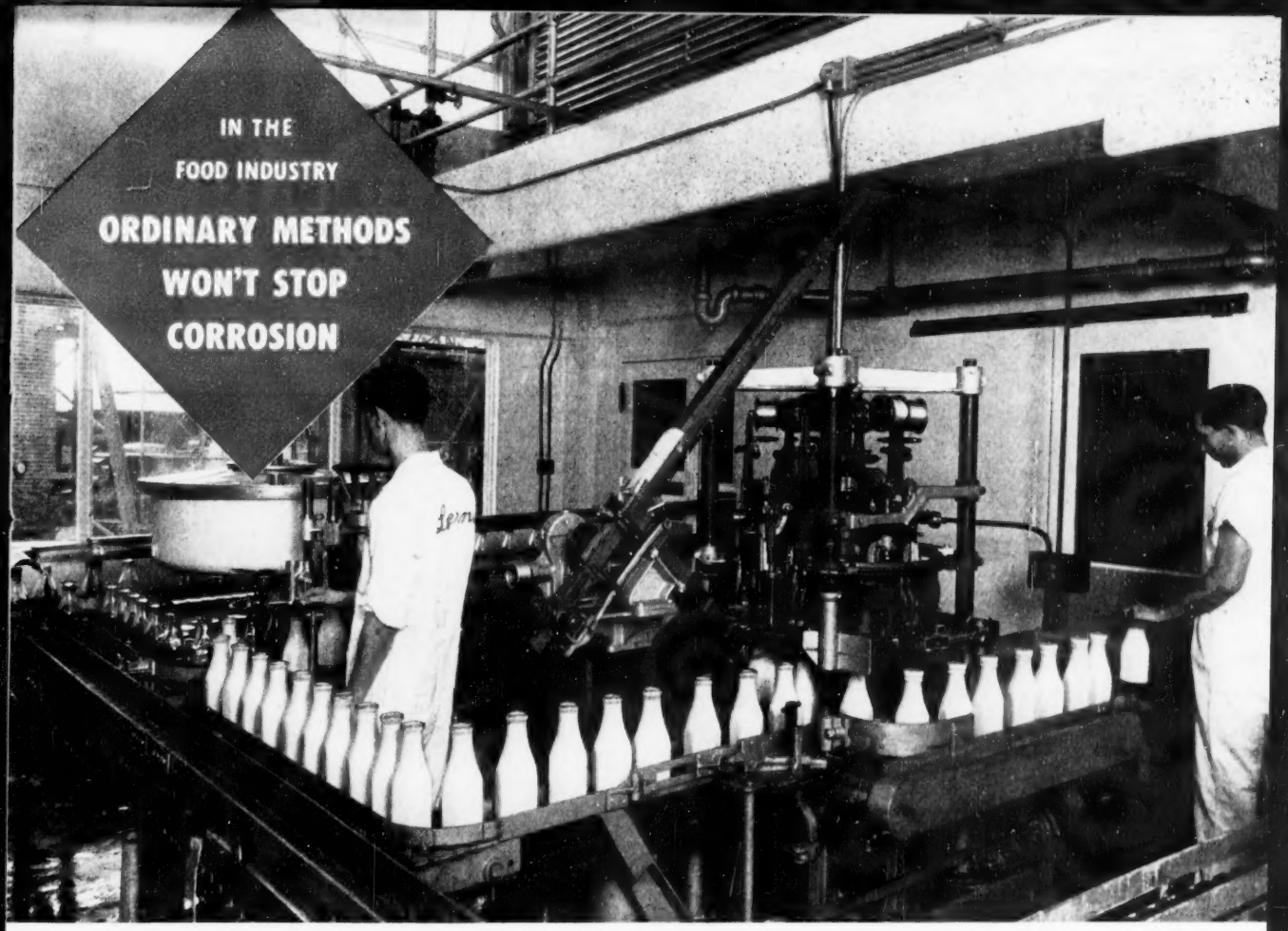
AIR SEPARATOR for separation of fines to 325 mesh and finer. Increases output from 25% to 300%... lowers power costs by 50%. Capacities ¼ to 50 tons per hour output.

*Registered trademark of the Sturtevant Mill Company

STURTEVANT MILL COMPANY

106 CLAYTON STREET, BOSTON 22, MASS.

DESIGNERS & MANUFACTURERS OF: DENS AND EXCAVATORS • MIXERS • SCREENS • PULVERIZERS • ELEVATORS • AND COMPLETE FERTILIZER UNITS



SPECIFY THE AMERCOAT METHOD— Designed to Give You *PLUS* PROTECTION

Ordinary methods for controlling corrosion usually produce the ordinary results—rapid paint failure, costly replacements, product contamination, excess down-time, and hampered production. Halfway measures and the use of one or two general purpose coatings simply cannot provide adequate protection against corrosion's ceaseless attack.

Amercoat gives you a proven method of corrosion control, assuring you proper protection through these PLUS features:

1. Careful analysis by a trained engineer of all the conditions present in each corrosion problem.

2. The ONE best recommendation for the particular problem. AMERCOAT is a complete line of coatings, each formulated to solve or control specific corrosion problems.

3. On-the-job assistance to your applicators and supervisors by a trained engineer. The AMERCOAT method ensures proper attention to surface preparation and application techniques for maximum protection.

4. Complete stocks of fresh materials always near you at one of AMERCOAT's five regional warehouses or more than 20 franchised distributor warehouses throughout the United States.

5. Service based on experience. The AMERCOAT method of corrosion control is the result of nearly 20 years' experience in solving or controlling corrosion problems in every major industry throughout the United States.

Write today for the name and address of the AMERCOAT representative in your area. At no obligation, he will gladly help you analyze your corrosion problems and evaluate your present control measures. If it is determined that you have a problem within our scope of experience, he will outline a complete program of AMERCOAT's PLUS protection for your plant or equipment.

Amercoat CORPORATION

4809 Firestone Blvd.
South Gate, Calif.
Chicago, Ill.
Newark, N. J.
Jacksonville, Fla.
Houston, Texas

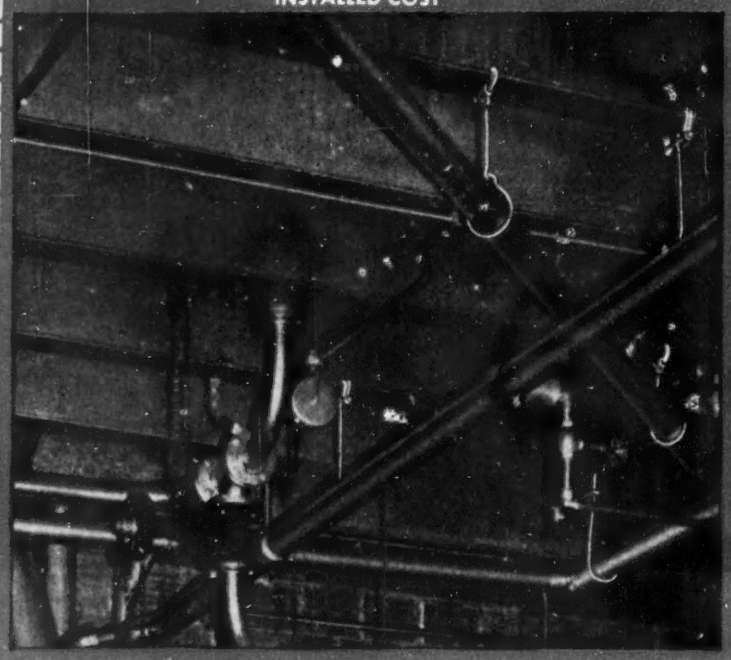
take a closer look at

Light-Weight STAINLESS PIPING

Schedule 5 and Schedule 10

INITIAL COST

INSTALLED COST

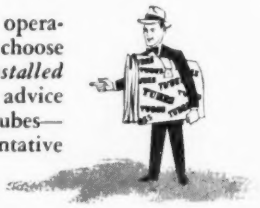


The *initial*-cost economy of Schedule 5 and Schedule 10 stainless pipe is always attractive but only pays dividends to the careful buyer. He is willing to remember that light-weight pipe frequently requires added supports or hangers and always requires special fittings. He also remembers that alignment problems may require a longer installation time. Therefore, he balances the attractive *initial* cost against *installed* cost.

The buyer also thinks of the adaptability of new piping to existing lines and possible future requirements such as increased operating pressures.

B&W manufactures all the standard pipe size schedules in a complete range of stainless steel grades. Thus, a buyer can obtain stainless pipe to meet any and every individual requirement.

It will pay you to analyze your operating requirements carefully and choose your stainless pipe on the basis of *installed cost* rather than *initial cost*. For any advice on stainless pipe or tubing, Mr. Tubes—your impartial B&W Tube Representative—is always on call.

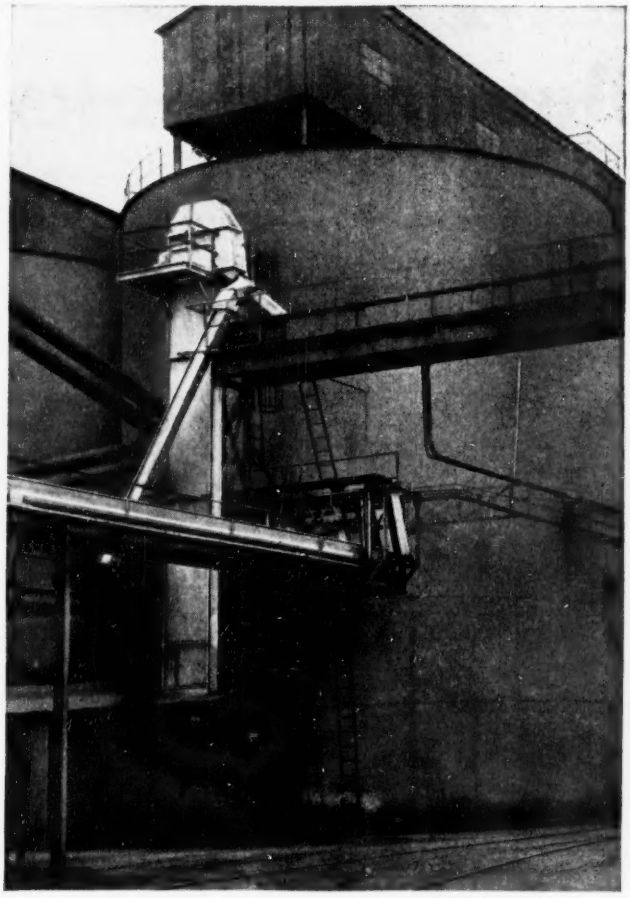


THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

B&W STAINLESS and WELDED TUBES

TA-1761 (G)

How to lower the cost of elevating



Let LINK-BELT recommend the bucket elevator that meets your requirements from 13 types in 4 basic designs

WANT to cut your cost of raising materials to processing machinery or to storage bins or silos? Regardless of the capacity required — or the characteristics of your material — there's a Link-Belt Bucket Elevator for the job.

Working with this broad line, Link-Belt engineers can select the one best-suited to your needs. A wide range of sizes on chains or belts is available.

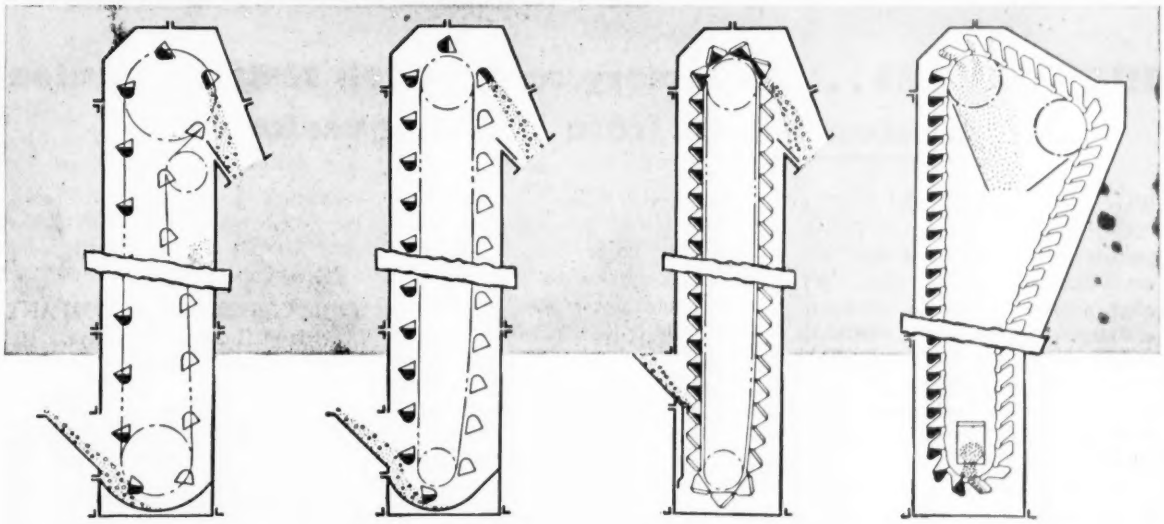
What's more, installation, maintenance and operating costs are low with Link-Belt Bucket Elevators. Rigid, jig-built casings are self-supporting, need only occasional lateral tie-ins depending on height. You have quick access to both head and boot for periodic inspections. Simple screw or gravity take-ups maintain chain or belt tension at all times.

There's an experienced materials handling engineer in the Link-Belt office near you. Call him for complete information.

LINK-BELT

BUCKET ELEVATORS

◀ Midwest soybean oil mill uses several combinations of Link-Belt Bucket Elevators and Screw Conveyors to insure smooth flow of beans throughout process.



Positive discharge
for light, fluffy, fragile or materials that tend to stick to the buckets.

Centrifugal discharge
for free-flowing, fine or loose materials with small to medium lumps.

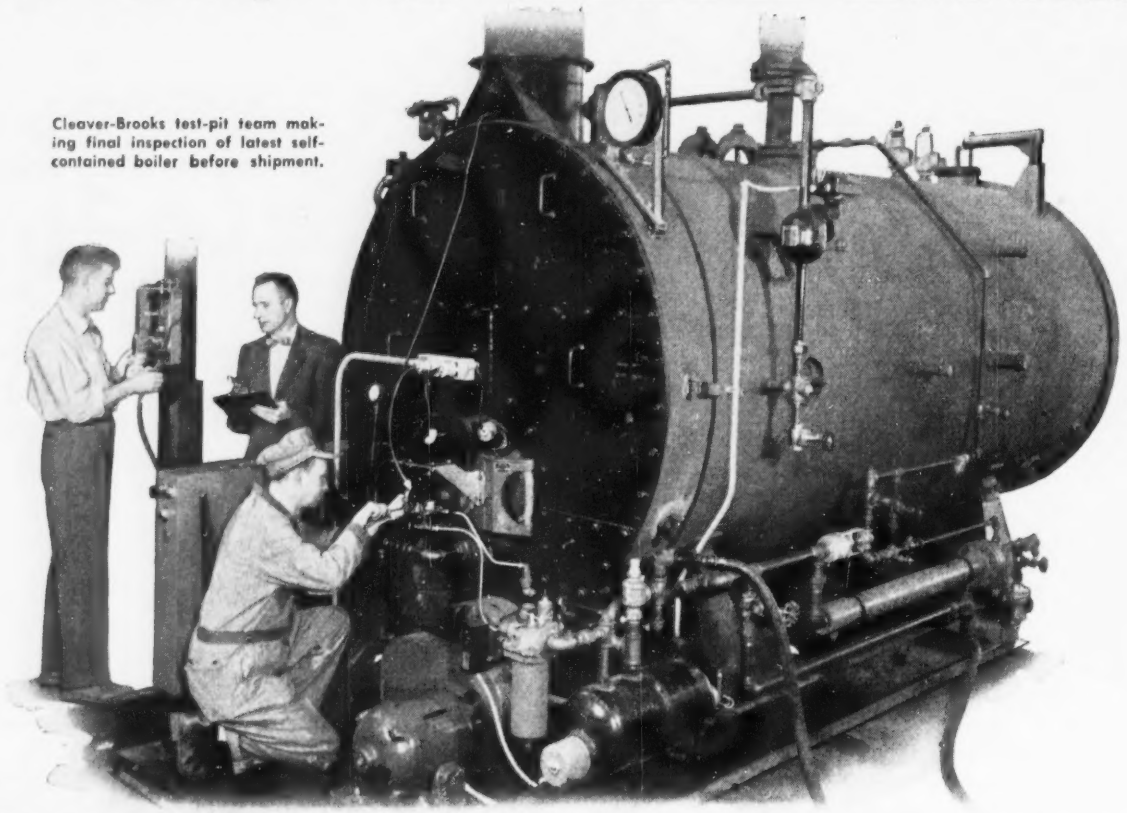
Continuous discharge
for range of materials —light to heavy, small to large, abrasive lumps.

Internal discharge
for gentle handling of small articles such as pellets, seeds, castings.

LINK-BELT COMPANY: Plants: Chicago, Indianapolis, Philadelphia, Colmar, Pa., Atlanta, Houston, Minneapolis, San Francisco, Los Angeles, Seattle, Toronto, Springs (South Africa), Sydney (Australia). Sales Offices in Principal Cities. 18,258

For more information, use coupon on page 159.

their counterpart "Test-Pilots" have at Cleaver-Brooks



Cleaver-Brooks test-pit team making final inspection of latest self-contained boiler before shipment.

HIGH SCORES . . . on factory and on-job tests guarantee greatest return from boiler investment

When test pilots give the familiar "O.K." — that's the sign of proven performance. It's the same with boilers in the Cleaver-Brooks plant. Only after accurate, thorough inspection and testing under actual operating conditions do boilers get the final "O.K." from experienced test engineers. That's why you get guaranteed 80% efficiency from your Cleaver-Brooks boiler.

A record of this test is available to every buyer on request. In fact, you as a buyer, consultant, or contractor are invited to witness the actual test on your Cleaver-Brooks boiler before shipment.

And further, Cleaver-Brooks boilers are placed in operation at the job site by factory service engineers who check installation, train your operators and make complete and detailed field tests.

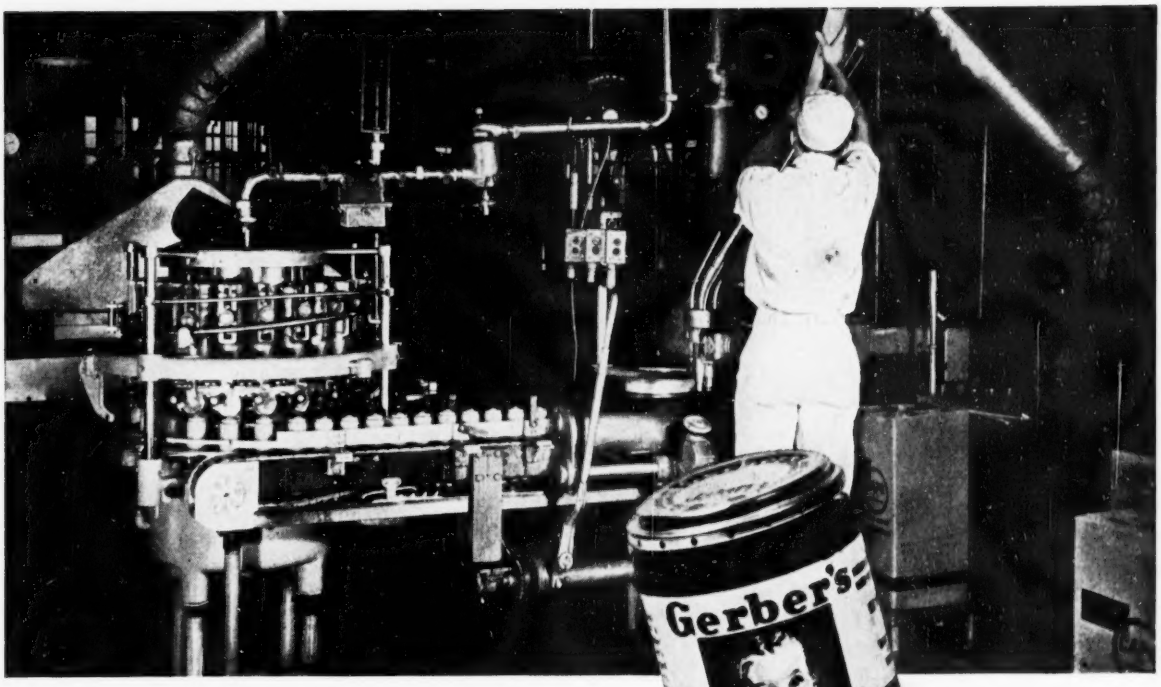
So, when you buy a boiler, insist on factory tests as well as field service tests by qualified engineers. There is no better way of insuring yourself of the very best value money can buy and the greatest return from your boiler investment. Look to Cleaver-Brooks, the leader in the "Packaged" Boiler field for two decades. Write today for latest Catalog AD-100.

Available for oil, gas and combination oil/gas firing.

CLEAVER-BROOKS COMPANY
Dept. H-355 E. Keefe Ave.
Milwaukee 12, Wisconsin, U.S.A.

Cleaver-Brooks
Originators of the Self-Contained Steam Boiler

BOILERS — STEAM OR HOT WATER — FOR HEATING AND PROCESSING IN SIZES FROM 15 TO 500 HP, 15 TO 250 PSI



PFAUDLER 21 STATION
Piston Filler in operation at Gerber plant in Rochester, New York.

How Gerber's fills ½ million jars a day in new Rochester plant!

From $22,462 a year to over a million dollars a week! That's the story of the growth of Gerber's Baby Foods over the last 25 years.

And the fast-moving pace of the baby food industry calls for modern, easy-to-clean equipment to assure top speed production with minimum down time.

Gerber's meets this need with 14 Pfaudler Rotary Piston Fillers. All their plants—Oakland, Cal.; Fremont, Mich.; Rochester, N. Y.—are equipped with these fillers, capable of turning out 500 Junior baby food jars per minute. The Rochester plant alone, which is the newest and most modern, produces about ½ million jars every day.

Pfaudler Piston Fillers are easy to keep sanitary, because the pistons and cut-off valves are quickly removed for thorough cleaning. No tools are required. All parts in contact with the product are stainless steel or copper-free nickel alloy to assure maximum purity.

Accurate controls permit you to adjust amount of fill to within 1/10 of an ounce—and perfect synchronization assures that none of the product is wasted. The "no-can, no-fill" feature further protects you against costly, unsanitary spillage.

If you want high-speed filling at low operating and maintenance costs, it will pay you to mail the coupon today for further information.

Pfaudler

THE PFAUDLER CO., ROCHESTER 3, NEW YORK
Engineers and Fabricators of Food Processing Equipment

Gravity Fillers · Deaerators
Piston Fillers · Vacuum Pans
Steam Peelers · Evaporators

THE PFAUDLER CO., Dept. FE-7, Rochester 3, N. Y.

☐ Send me the facts about Pfaudler Piston Fillers right away.

☐ Send me a copy of "The Glass Lining" (Vol. 18, No. 5), containing the story of Gerber's Baby Foods.

Name _____

Title _____

Company _____

Address _____

City _____ Zone _____ State _____

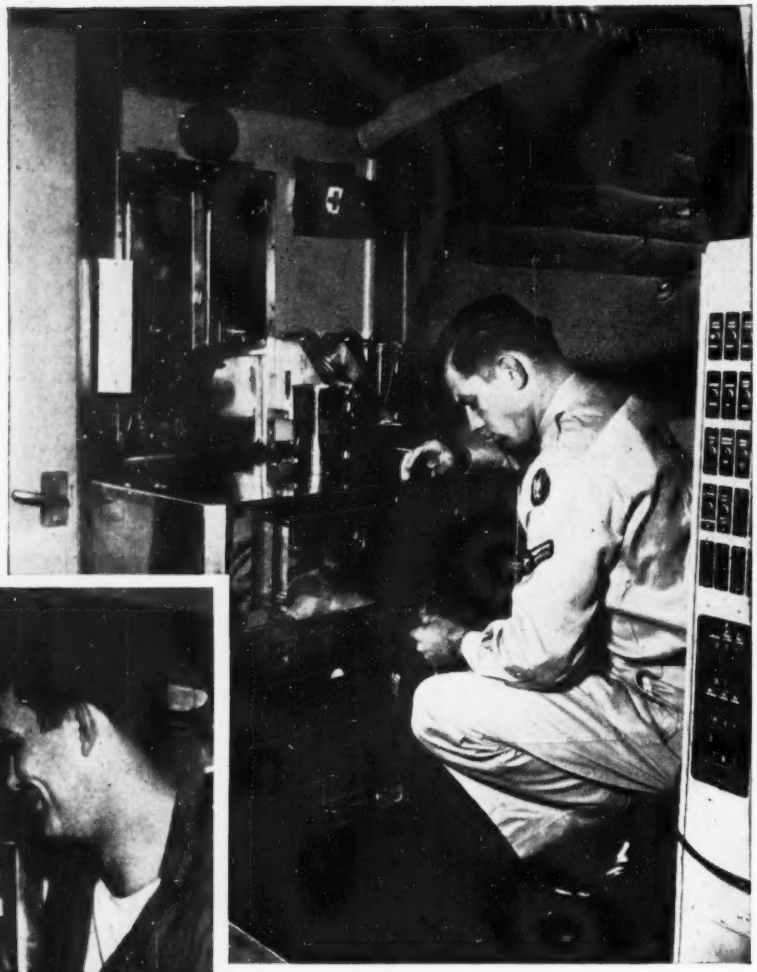
For more information, use coupon on page 159.

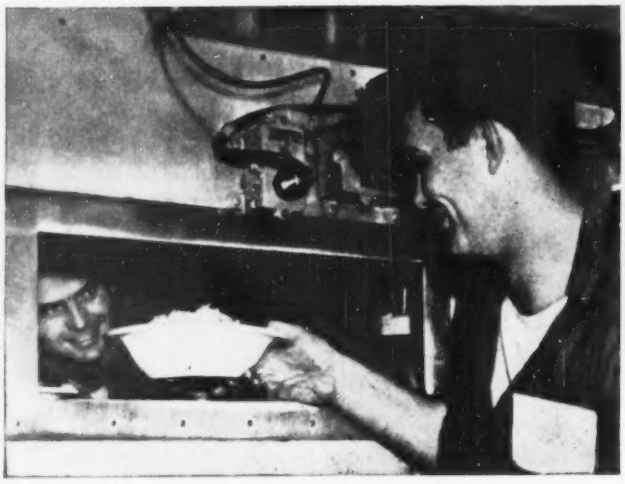
Sky-High

or

Fathoms

Deep





It's always STAINLESS STEEL

where

Food is

Concerned

From airplanes to subs and all points between, stainless steel is the one metal most associated with the preparing and serving of food. Why? Because it's the one metal that best combines *all* the desired virtues: beauty, strength, hardness, cleanliness, long life, low maintenance, easy fabrication, and high resistance to corrosion and heat. ● Now those are qualities to conjure with! Where can *you* use them? Where can you employ Allegheny Metal to improve your product or reduce costs in your equipment—and how can we help you? *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

You can make it **BETTER** with

Allegheny Metal

AL

TIME-TESTED STAINLESS STEEL

Warehouse stocks carried by all Ryerson plants

JENKINS PRACTICAL PIPING LAYOUT 67

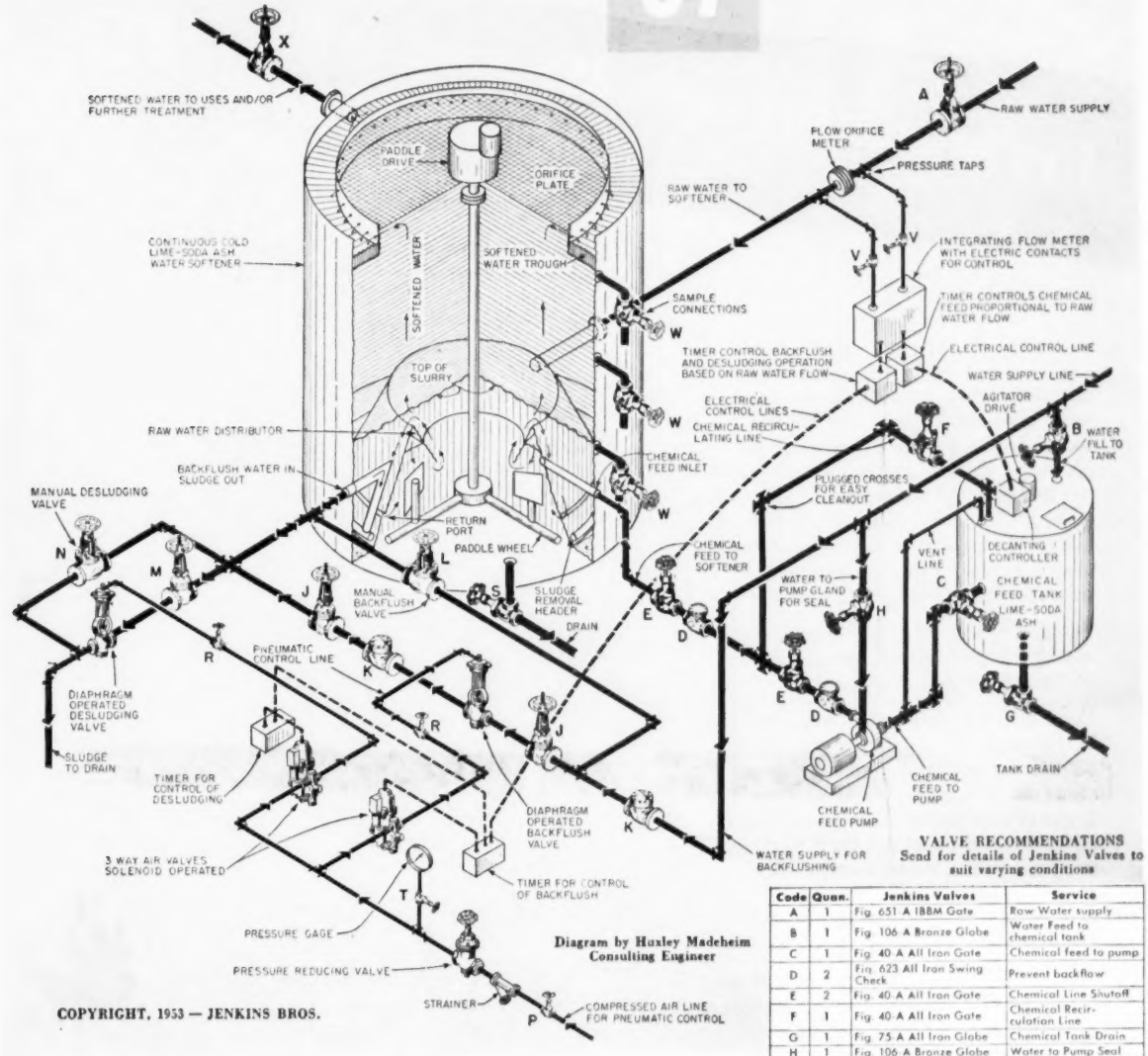


Diagram by Huxley Madeheim Consulting Engineer

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VALVE RECOMMENDATIONS
Send for details of Jenkins Valves to suit varying conditions

Code	Quan.	Jenkins Valves	Service
A	1	Fig. 651-A IBBM Gate	Raw Water supply
B	1	Fig. 106-A Bronze Globe	Water Feed to chemical tank
C	1	Fig. 40-A All Iron Gate	Chemical feed to pump
D	2	Fig. 623 All Iron Swing Check	Prevent backflow
E	2	Fig. 40-A All Iron Gate	Chemical Line Shutoff
F	1	Fig. 40-A All Iron Gate	Chemical Recirculation Line
G	1	Fig. 75-A All Iron Globe	Chemical Tank Drain
H	1	Fig. 106-A Bronze Globe	Water to Pump Seal
J	2	Fig. 651-A IBBM Gate	Backflush Valve Shutoff
K	2	Fig. 624 IBBM Swing Check	Prevent Backflow
L	1	Fig. 142 IBBM Globe	Manual Backflush Valve
M	1	Fig. 651-A IBBM Gate	Desludge Valve Shutoff
N	1	Fig. 142 IBBM Globe	Manual Desludge Control
P	1	Fig. 106-A Bronze Globe	Compressed Air Line Shutoff
R	2	Fig. 106-A Bronze Globe	Pneumatic Control Line Shutoffs
S	1	Fig. 100 All Iron Gate	Softener Tank Drain
T	1	Fig. 741-G Bronze Needle	Pressure Gage Control
V	2	Fig. 741-G Bronze Needle	Flowmeter Pressure Tap Shutoffs
W	3	Fig. 75-A All Iron Globe	Sample Takeoffs

How to plan a CONTINUOUS COLD LIME-SODA ASH WATER SOFTENING SYSTEM

A common method of softening water by removing calcium and magnesium salts, the cold lime-soda ash process is now employed in virtually every major industry. Depending on plant requirements, it can be installed to operate as a batch-process or continuous-process system.

The continuous-process system is illustrated. As raw water combines with a lime-soda ash solution pumped from the chemical feed system, microscopic particles form and mix with coagulated precipitate in the tank.

In constant circulation, the mixture of water and precipitate first rises through the mixing zone, then flows down around the outside cone to reenter the mixing zone via a return port. A small portion rises through the slurry to the top and enters the softened water trough for further treatment or use. Larger, denser masses of precipitate drop down to be removed by the desludging system, which automatically loosens up the compacted sludge and drains it off for a predetermined length of time.

Consultation with accredited piping engineers and contractors is recommended when planning any major piping installation.

To save time, to simplify planning, to get all the advantages of Jenkins specialized valve engineering experience, select all the valves you need from the complete Jenkins line. It's your best assurance of lowest cost in the long run. Jenkins Bros., 100 Park Ave., New York 17.

Complete description and enlarged diagram of this layout free on request. Includes additional detailed information. Simply ask for Piping Layout No. 67.

JENKINS
LOOK FOR THE DIAMOND MARK
VALVES
SINCE 1864
TRADE JENKINS MARK
Jenkins Bros

From farm-produced sugars, Atlas makes sorbitol ...a natural food ingredient

Sorbitol is now available from Atlas in mass production quantities for use in foods. Derived from abundant farm-produced sugars, sorbitol is a member of the higher alcohol family which includes other well-known edible compounds. For many years, sorbitol has been known and used by dietary specialists and for the synthesis of Vitamin C (ascorbic acid).

Sorbitol is found in nature as a sweet, nutrient ingredient of many edible fruits and berries.

Food technologists have been encouraged by its current availability and its interesting qualities, and have been studying its application to various types of foodstuffs. They have found advantages for sorbitol for a variety of applications, on account of its ability to stabilize moistness and extend shelf life . . . and create distinctive new effects.

Among the foods to which sorbitol has contributed outstanding new qualities are shredded coconut, beverages, glace fruits, marshmallows, caramels, nougats, fudges, chewing gum and flavor preparations.

Atlas sorbitol is available as SORBO® (70% sorbitol solution) and in pellet or powdered crystalline form. Why not check the possibilities for sorbitol in your product?

INDUSTRIAL CHEMICALS DEPARTMENT

ATLAS POWDER COMPANY

WILMINGTON 99, DELAWARE

offices in principal cities

ATLAS POWDER COMPANY, CANADA, LTD.
BRANTFORD, CANADA

For more information, use coupon on page 159.

Five basic types of gear-motors are also available with Fluid Drives.

Master Fluid-Drive units make use of a fluid coupling so designed that it can be interposed easily between the motor shaft and the output shaft (or motor shaft and first stage of gears of a gear-motor). Use Master Fluid-Drive Motors and gain these advantages.

SMOOTH ACCELERATION. With the fluid drive, the load is gradually accelerated . . . no sudden jerk at starting.

FULL POWER. Since there is no load on the motor when it starts, it very rapidly attains full running speed and the duration of the starting current inrush is greatly reduced.

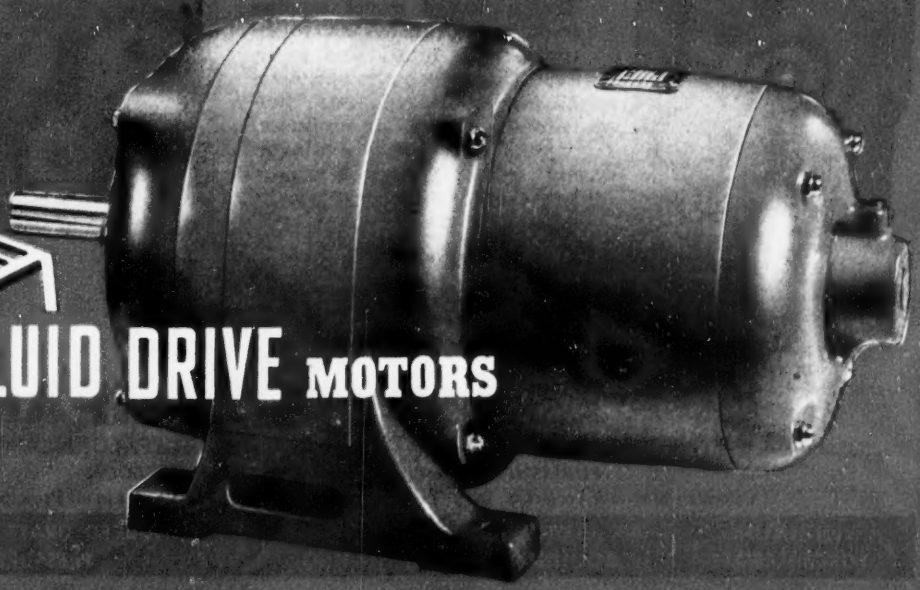
CUSHION EFFECT. Provides cushioned starting . . . protects motors, gears, and driven equipment from damage from severe shock loads.

WIDE APPLICATION. Fluid-Drive Motors are ideal for high inertia applications where it takes a long time to bring the load up to speed . . . for starting crane travel drives without jerking and swinging the load . . . for conveyor drives especially where they are handling fragile material . . . for agitators, textile machinery, presses, extruders, winding machinery, food machinery, laundry machinery, ball mills, calenders, machines, etc.

cushioned power

SIZES. Master Fluid-Drive Motors are available in sizes approximately ½ to 15 horsepower.

THE MASTER ELECTRIC COMPANY • DAYTON 1, OHIO



MASTER

FLUID DRIVE MOTORS

DON'T LET WINTER ROB YOU OF PROFITS!

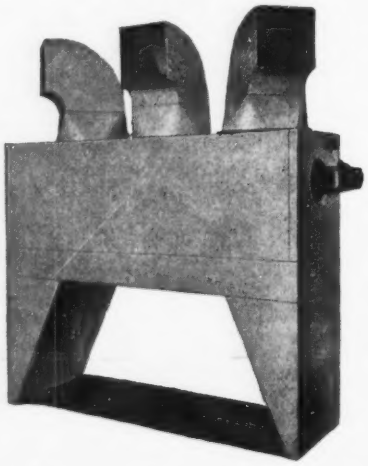
ADVANCE WEATHER FORECAST
Mercury to Drop to Zero.
COLD GRIPS CITY

NOW'S THE TIME TO INSTALL "Buffalo" UNIT HEATERS

Winter can put the "chill" on your plant and people, cutting down production, efficiency, and profits! Why take the chance? "Buffalo" Unit Heaters warm up hard-to-heat corners and areas—at low cost. Compact "Buffalo" heaters are easily and quickly installed. So right now, while it's hot, make sure it's warm in your plant next winter!—Install "Buffalo" Unit Heaters!

BREEZO-FIN

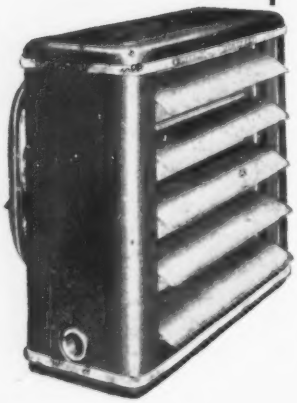
"Buffalo" Breezo-Fin Heaters deliver comfortable heat in small areas and operate economically on as little as 2 lbs. steam. Available in 20 sizes; have high-quality copper finished heater element for maximum radiation and "Buffalo" Breezo Fan to throw heat positively. Write for Bulletin 3137.



HIGHBOY

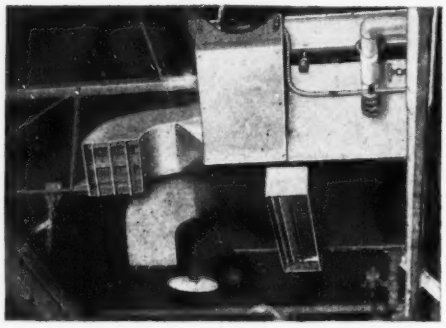
The Highboy is ideal for heating that "new addition" or any large area.

Highboy is easily adapted to your present heating system, since it has adjustable outlets for duct connections and louvers. Unit pictured has "Buffalo" non-corrosive Aerofin heater element and mixed-flow fans on hollow shaft. "Buffalo" can supply arrangements and combinations tailored exactly to your individual needs. Write today for Bulletin 3704.



NO WASTED FLOOR SPACE WITH LOW-BOY!

This suspended model supplies fresh, warm, filtered air to an entire room. In addition to its high-efficiency non-corrosive Aerofin heater element, it has "Buffalo" mixed flow fans on hollow shaft. When used as a window installation, it supplies makeup air for plants using large capacity exhaust systems.



"Buffalo" FIRST FOR FANS

BUFFALO FORGE COMPANY

152 MORTIMER ST. BUFFALO, NEW YORK

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont. Sales Representatives in all Principal Cities

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING
FORCED DRAFT COOLING HEATING PRESSURE BLOWING

For more information, use coupon on page 159.

It's smart to stick with Swift's Adhesives

They serve you and food shoppers, too.

Canned or bottled products that go home with shoppers should have attractive, neat appearing labels. That's why so many manufacturers look to Swift for labeling adhesives. Swift's specialized adhesives provide a lasting bond for labels on bottles, jars and cans. And more! Swift has equally effective adhesives for many other uses.

When you need adhesives, always remember—

- Swift has years of specialized experience in adhesives production.
- Swift works with a broad range of quality raw materials.
- Swift has extensive adhesives manufacturing facilities . . . distribution points from coast to coast.

Two adhesives for packaging operations

#1485 pick-up gum — handles easily on high-speed lines, doesn't stain and leaves no shiners.

#446-J lap paste and case seal — operates at high speeds, non-wrinkling and non-staining, easy to use, and doesn't loosen up under moist conditions.

The National Cranberry Association of Hanson, Massachusetts, uses Swift's #1485 pick-up gum and #446-J lap paste and case seal adhesive in their canning operations. Tight, neat labels and securely glued cases are assured.

Call **SWIFT** first for **ADHESIVES**

SWIFT & COMPANY
Adhesive Products Department
Chicago 9, Illinois

This offer expires August 31, 1953

Please send your 100-lb. introductory trial shipment of:

☐ Swift's #1485 pick-up gum
☐ Swift's #446-J lap end paste and case seal

} At the quantity prices

These will be tested for use in our operations. We understand, if not fully satisfactory, they may be returned for credit at your expense.

Name _____ *Title* _____

Firm Name _____

Address _____

City _____ *Zone* ____ *State* _____

For more information, use coupon on page 159.

Call Ryerson . . .

for Stainless Pipe and Tubing . . . *every other stainless product*

Just a single call to your nearby Ryerson plant brings everything you need in stainless pipe and tubing—any type, size or quantity for the most exacting requirements of heat and corrosion resistance.

That's because Ryerson stocks are not only large, but varied to meet your special applications. (See list at right.) What's more you can have your steel accurately cut to specification and you can always be sure of quick delivery from Ryerson.

You can be sure of quality, too. All stainless pipe and tubing from Ryerson meets appropriate ASTM specifications. All is pressure tested and rigidly checked for ductility to insure best forming characteristics.

You can also get quick delivery on stainless screwed and welding pipe fittings, Quikupl fittings for time-saving assembly and globe and gate valves. So for complete stainless service, including the help of our stainless specialists, call your nearby Ryerson plant.

STAINLESS PIPE AND TUBING IN STOCK

Note that our stocks include Schedule 5 and 10 light wall pipe which you can use in place of standard pipe for many applications. With light wall you reduce weight 17 to 65% — with proportionate savings in cost. Yet capacities are increased.

TP304 Pipe.....Schedule 5—Light Wall—Welded
Schedule 10—Light Wall—Welded
Schedule 40—Standard Weight—Seamless & Welded
Schedule 80—Extra Heavy Weight—Seamless

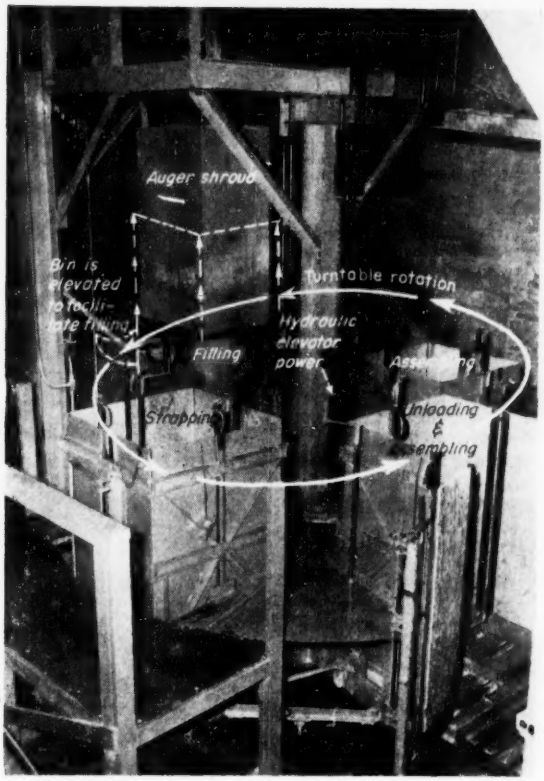
TP316 Pipe.....Schedule 5—Light Wall—Welded
Schedule 10—Light Wall—Welded
Schedule 40—Standard Weight—Seamless & Welded
Schedule 80—Extra Heavy—Seamless

TP304 Tubing...Seamless & Welded
TP316 Tubing...Seamless & Welded

Other Stainless Products in Stock: Sheets, Plates, Rounds, Flats, Squares, Hexagons, Angles

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE



Fills single carton equal to 20 bags

IN OPERATION of packer assembly (left), flour is delivered (via automatic scale on floor above) through a packing auger housed in dust-proof shroud. Turntable, which moves counter-clockwise, has four jigs (3x3 ft. by 5 ft. high) in which corrugated bins are consecutively assembled, filled, and closed. Above: Completed 1-ton bin holds equivalent of 20 100-lb. sacks (right).

HAROLD A. HERZOG
Warehouse Superintendent, Fisher Flouring Mills Co., Seattle, Wash.

GIANT PACKAGE PAYS OFF

Declaring sacks "out," Western flour plant speeds packing one-third by adopting "king-size" returnable corrugated bins. And bakeries that receive them chalk up significant labor savings. . . . Cleanliness, shipping economies are added features

The world's largest flour-packer, recently installed at Fisher Flouring Mills Co., Seattle, Wash., increases packaging production by 33 percent. It represents the latest stage in the progressive development of Bulk-Pak-Bin methods of handling flour and other bulk materials.

Evolutionary material handling principles have led, for some time, to the elimination of small containers. But the fact that a ton or more of product had to be packaged in a single bulk container pointed up the necessity for strength.

It first was thought that the unit would have to be built of strong, heavy, and expensive materials. However, it was found that corrugated board had the qualities desired—and at low cost—if properly supported to add to its strength.

First developed by Fisher and the Container Corp. of America, the reusable, 1-ton Bulk-Pak-Bin is made of B-flute, single-wall, corrugated paper. The new, semi-mechanical packer, manufactured by Richardson Scale Co., Clifton, N. J., from Fisher specifications, brings additional benefits.

One Every 3 Min.

It provides means of accurately weighing 1-ton lots of flour into these giant packages on a continuous basis. A three-man crew operating this new unit turns out a complete package every 3 min.—20 tons of product an hour. Another man, using a lift-truck, loads freight cars with 36 of these bins as rapidly as they are packaged.

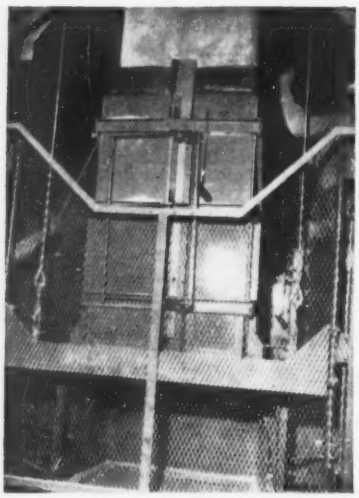
Because bins eliminate manual handling, bakeries report significant reductions in labor costs in handling flour. At point of destination, one man can unload two rail cars of these packages in the same time required for two men to unload one car of sacked flour. Bins may be stored three-high and storage space savings indicate that three carloads may be stored in the same space needed for two cars of sacked flour. Using a lift-truck, one man can dump 1-ton from a bin into the blender in 10 min., compared to the 30 min. required to dump the same quantity of sacked product. And eliminated is the risk of dust, lint, or any thread from sacks being mixed

Cartons assembled, filled, closed, and . . .

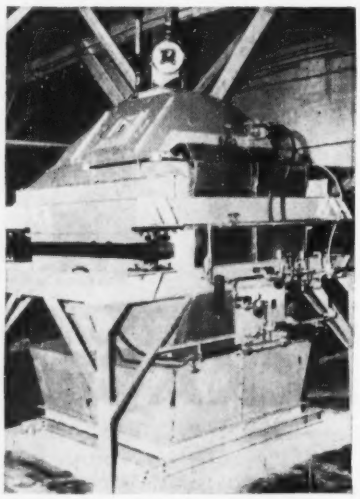
Wood rib positioned in jig

Tube placed on bottom cap

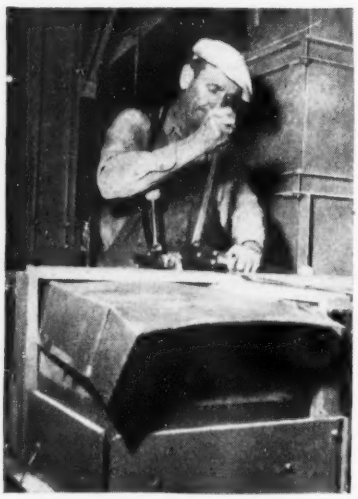
Bin moved to filling station



Shroud, auger enter lifted bin

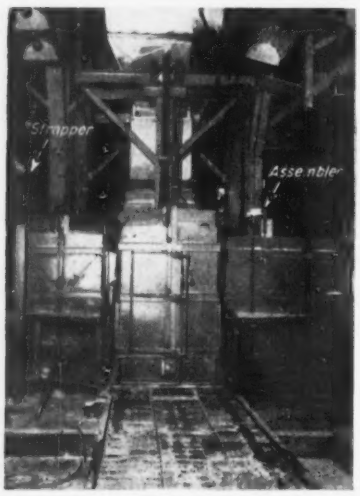


Scale (floor above) feeds flour

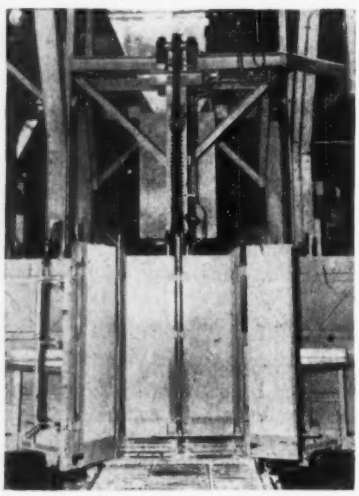


Steel straps go around bin

. . . ready for shipping



Jig (center) aligned for exit . . .



. . . is opened, and bin's away

with the flour that is moving into the blender unit.

A continuously operating screw delivers flour from storage silos to one of the two compartments of the automatic scale. Each of these hopper-compartments holds 2,000 lb. of flour. The continuous stream of product fills one of these to a pre-set weight, then is automatically diverted to the other. One compartment is being filled while the other discharges into the bin below it.

With two exceptions, the turntable assembly, in which the bins are formed, filled, and closed, resembles, on a large scale, smaller packaging machines used in the food industry. Instead of being mechanically formed and closed, these huge packages are set up and closed with steel straps by hand.

The 12 ft.-dia. turntable, mounted

on ball bearings, is comprised of four steel bin-jigs, or forms, set 90 deg. apart. These jigs are plywood lined, have three fixed sides. The fourth side is a divided door, and the floor of each jig has rollers to facilitate removing filled bins.

Shaping Them Up

To form a bin, the assembler first places a pallet on the roller bottom of the jig. Next, he positions four tapered wooden ribs (2 x 6 in. by 5 ft. high) in vertical channels provided for them, including one in the door. These ribs are shaped so that they have the greatest strength where the most pressure is applied, in the approximate center of the sides of the bin.

The bottom-cap, of 200-lb. test corrugated paper board, is then placed on the pallet and the 275-lb. test corrugated paper tube fitted in this. These tubes, 3 ft. square by 5 ft. high, are stitched along the seam. The doors of the jig are closed and locked with a toggle latch. Spring clips hold the wooden members upright, and metal retainers hold the paper board in position.

The turntable brake is released and this completed bin is moved a quarter turn under the loading auger and directly over the elevator. The auger, which is enclosed in a metal shroud slightly smaller than the inside dimensions of the bin, is powered by a 20 hp. gearhead motor.

A latching mechanism positions the carton directly under the 12-in. packing auger. The elevator, operated by a specially designed hydraulic system, then raises the entire jig and bin. In packing position, the auger first is close to the bottom of the bin. The jig, at the top of its travel, has tripped an interlock switch, opening a gate in the scale hopper and starting the auger. The shroud, which fits closely around the inside periphery of the bin, eliminates dusting during the filling operation.

Compressing Action

The auger differs from those usually used in flour mills. All blades, except the bottom one, serve merely as conveyors. The bottom blade, a "club-foot", compresses the flour into the carton both vertically and horizontally at 2,000-3,000 lb. total pressure, filling it uniformly.

As the bin is filled, it is forced downward until it finally resumes its normal position in the turntable. The unit is then rotated another quarter turn, moving the filled bin to the strapping station and another empty bin under the filler.

The strapper, working on an elevated platform, places the corrugated paper cap over the bin and, on top of this, wooden cross pieces which join the upright wooden ribs. Metal channels in the sides and bottom of the jig, located directly behind each of the wooden ribs and criss-crossing the bottom under the pallet, simplify threading of the steel strapping around the bin. The two straps are tightened with an Acme Pneumatic Stretcher at a tension running about 900 lb. The product is now tightly and securely packaged.

"Done and Out"

The turntable is moved another quarter of a turn and the bin is rolled out of the jig upon a length of roller conveyor. The top and bottom caps of the bin are securely sealed with reinforced paper tape, and the bin is then rolled to the end of the conveyor. A lift truck picks up the 1-ton package and moves it into a rail car or truck.

Railroad men like these Bulk-Pak-Bins because they minimize freight damage claims. In rail cars, bins are loaded in rows of three, except between the doors, where six bins are placed in rows of two abreast. Spaces between rows are shored by tapered timber gates. These gates are linked at each end by 4 x 4 in. timbers. Heavy metal strapping, extending between the timbers, holds the bins tightly together, preventing motion during shipment. Trucks are loaded with seven of these bins in 5 min. by one man using a lift-truck.

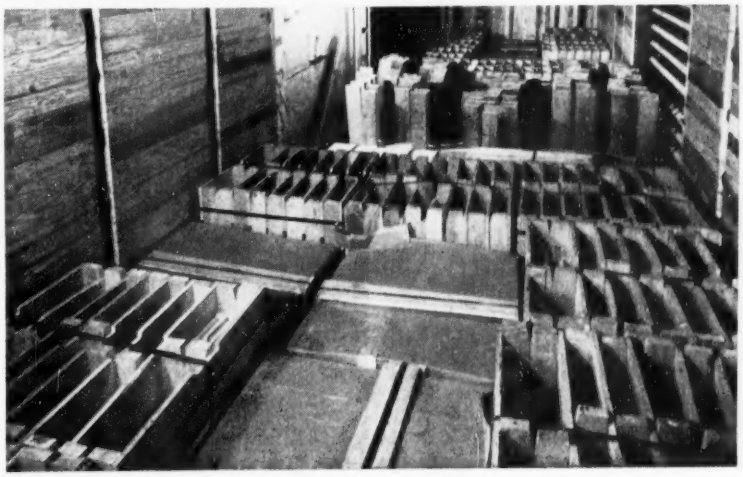
Unloading, at point of destination, is performed simply. Size of the bins makes it easy to maneuver them with lift-trucks inside rail cars or trucks.

Bakery Use

In the bakery, bins are moved by lift-trucks from storage to one of several kinds of unloading devices specially developed to handle them. Equipment required for a bakery installation may vary. Commonly, a dumping device and small lift-truck

Minimizes in-transit damage

RAIL-CAR takes 36 of bins, compactly, safely. Seven fill a truck.



COLLAPSED bins and wood members from ten cars fill one return car.

are sufficient. Such dumpers occupy no more space than that used for cutting sacks and dumping flour.

By cutting one strap and removing two of the upright wooden staves and one cross piece, the top cap of corrugated board will hinge open. The bin is then automatically dumped into the flour blender. One large West Coast bakery using this method of bulk handling estimates its total annual savings at $15,000.

Additional Savings

Other features of this 45-cu. ft. bin are its tare weight—less than 4 percent of total, and the fact that the collapsed bin requires less than 9 percent of the space it needs when filled.

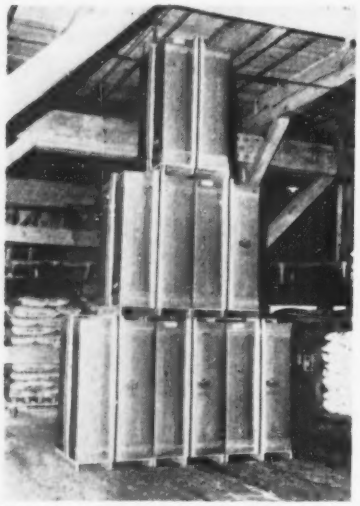
A nominal charge to the baker is made for the use of the bin, bases being depreciation of its parts, return freight costs, and other factors. Collapsible features of the unit make it easy to store and to ship. Thirty-six of these empty bins, which when filled make up a rail-car, are gathered into three units, approximately the size of only one filled bin. The empties from ten carloads, together with shoring units having a total weight of 32,120 lb, are returned in a single rail car. For each twelve full truck loads of flour, only one truck load is needed to return empties.

When returned to the mill, all units are first fumigated, then placed in storage until needed. The corrugated paper members are cleaned by compressed air and brushed. Any damaged units are discarded.

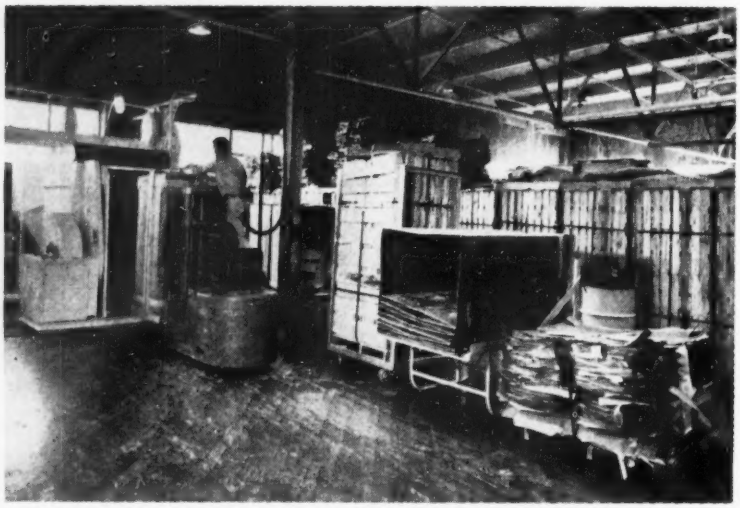
Fisher estimates the life of the corrugated members at four round-trips. Following this they can be used as feed containers or for rail car linings. Wooden members have an estimated life of 20 round-trips. In comparison with other types of bulk packages, the original investment in these may be considered as low.

Initially designed as a collapsible unit, the bins may be kept intact and used for non-food items.

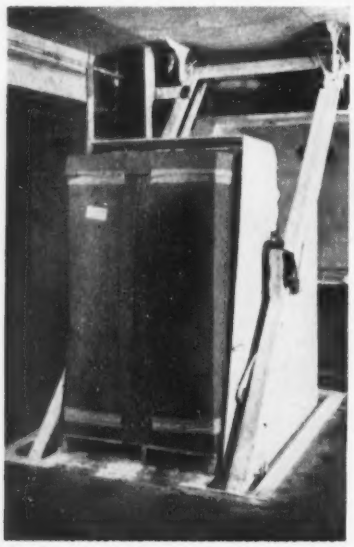
Improves Flour Handling at Bakeries

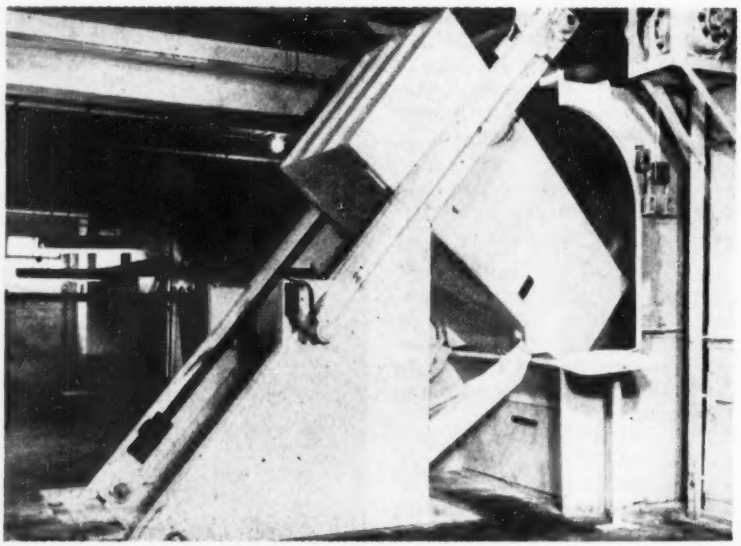


BINS readily store three high, use one-third less space than sacks.



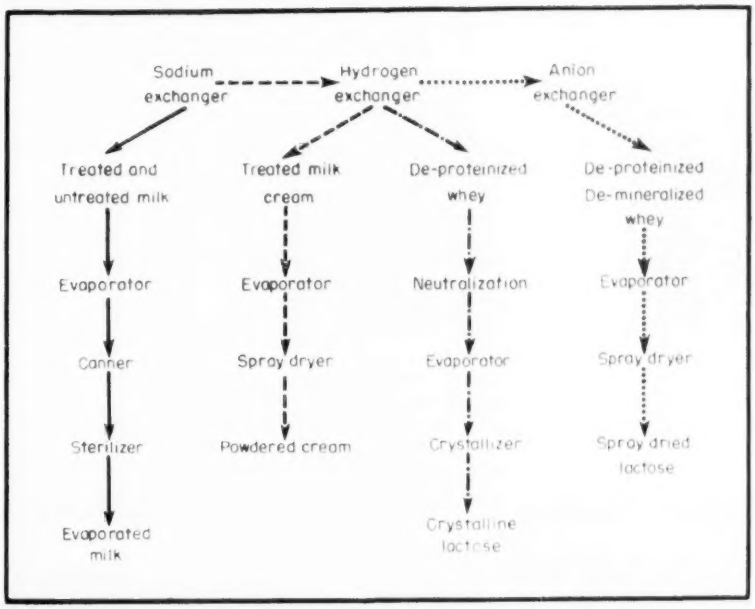
LIFT-TRUCK simplifies operation of handling bins to dumper (left). Note knocked-down bin assemblies (right) ready for return to supplier.





DUMPING is fast "one-two" operation: With one strap and three wooden members removed (left photo), lid is freed. Then bin is tipped (right), letting flour flow into blender with minimum dusting.

Dried creams that disperse rapidly in hot coffee, special dried milks, and heat-stable evaporated milks are some of products made possible by use of new exchanger materials



SCHEMATIC of new processes that result in superior dairy products.

Dairy Products Improved By Ion Exchange

O. F. GARRETT,

Director of Research, M & R Dietetic Laboratories, Inc., Columbus, Ohio.

Since milk is a complex biological material containing many ionizable compounds, ion exchangers can be used to alter certain of its physical properties and chemical characteristics —particularly the mineral elements.

And by employing the newer types of ion exchange materials, various end products, such as stabilized evaporated milk, lactose, special milk powders, and quickly dispersible stable cream powders, may be produced.

In carrying out the new process*, the cation exchanger may be used alone or in sequential combination with an anion exchanger. Thus a portion of certain mineral elements may be removed and other ions substituted, or the product may be almost completely demineralized.

In the art of manufacturing evaporated milk, it is frequently necessary to change the ratio of calcium to phosphorus in order to have a product that is stable to the high heat employed in the sterilization step. This is accomplished by adding a quantity of sodium phosphate or sodium citrate.

In the ion exchange process, however, a minor portion of the milk is passed through a cation exchanger acting in the sodium cycle, during which a portion of the calcium is removed. Treated milk is then blended with the main portion and the whole is condensed, canned, and sterilized. The process results in heat stabilizing the concentrated milk without addition of chemicals.

In another application, there are manufactured dried creams that are stable in hot coffee and disperse rapidly when added to it. In the process, defatted milk is treated with a cation exchanger material active in the sodium cycle and then with one active in the hydrogen cycle. The treated milk is then blended with high fat cream and the whole is condensed and spray dried.

Recovery of lactose from de-proteinized whey is accomplished by first treating the whey with cation exchanger material acting in the hydrogen cycle and sequentially with an anion exchange material. The combination treatment results in a substantially complete demineralization of the whey, which is then condensed and spray dried. It enables recovery of practically all the lactose in a high grade form.

Alternate Method

Another method for recovery of lactose from whey, either before or after de-proteinization, is by treating with a cation exchanger material acting in either the hydrogen-, the sodium-, or the mixed hydrogen-sodium cycle. Substantially all of the calcium and magnesium is removed, and the mineral anions are converted into soluble salts or acids. Where necessary, de-proteinization is then carried out.

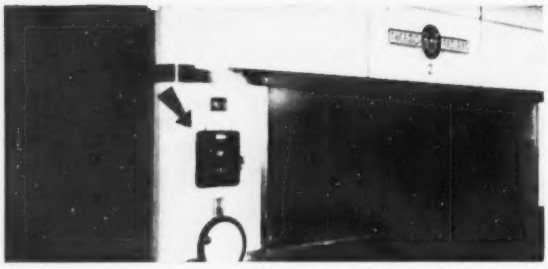
If the exchange-treated whey is high in acidity, the acid is partially neutralized with an alkali to convert it to soluble salts. But no attempt is made to completely demineralize it. The product is then condensed, and the lactose is crystallized therefrom in a conventional manner. Approximately 80 percent of the lactose originally present in the whey is recovered as a high quality, crystalline product.

M & R Dietetic Laboratories' interest in the newer types of ion exchangers and their possible application to the processing of milk and milk

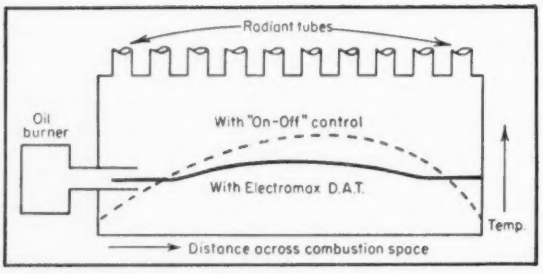
(Turn to page 141)

* Basic process described herein is one in which newer resinous ion exchangers are employed as distinguished from older type of base exchange materials such as are used in the M & R process of producing soft curd milk. Both cation and anion exchangers may be employed, according to result desired in end-product.

"Wiggles" Removed



RADIANT-HEAT traveling-tray oven displays new precision in multi-product baking due to action of low-cost impulse type electronic controller (arrow).



TEMPERATURE GRADIENTS inside combustion space of oven graphically indicate how new controller has levelled out heat distribution.

Bakes Better Products and Saves Fuel With

New Continuous-Oven Control

Vast improvement in performance of multi-product, traveling-tray oven made with low-cost "heat proportioner." Optimum color obtained consistently

R. N. BREY, JR.
Field Engineer, Leeds & Northrup Co., Philadelphia

Its compact efficiency and versatility have boosted the radiant-heat traveling-tray oven to a lofty spot in the American baker's equipment "Hooper Rating". But like any headliner, a certain amount of coddling is often necessary to consistent top performance.

With the single-lap traveler it's a matter of proper heat distribution.

This placing of a continuous conveyor in so small a space made it impossible for oven designers to locate heating tubes in optimum fashion. Hence, wide temperature gradients throughout the oven mar perfect performances unless almost zealous concern is devoted to heat control during the bake.

Solving this poser by adroit automatic instrumentation seems the ready answer. But there are complicating facts: First, the very nature of the ailment—variable heat distribution—makes it necessary to find a spot at which representative temperatures can be measured, in order to have a basis for control.

Add to this the fact that top efficiency from radiant heating requires a full burner flame. This, of course, eliminates the use of versatile full-throttling control action so effective on direct-fired ovens.

Schaible's Bakery, Easton, Pa., is one which has licked the problem. By utilizing a specially applied controller that continuously *adjusts the ratio* of burner on-off operation it has—

- **evened heat in combustion space.**
- **narrowed across-tray temperature gradients.**
- **leveled down front-to-rear fluctuation.**
- **sharply cut effects of flash heat.**

Schaible's first saw the opportunity for such results when it examined some temperature records run off by Leeds & Northrup Co. on a reversing traveling tray oven. The firm recognized the similarity to the problems of its own non-reversing oven.

These records show that oven heat distribution is uneven from side to side, front to rear, and top to bottom, under conventional on-off control. The cycling effect is apparent, with periodic high and low heat, and wide gradients across the moving trays. Such gradients, of course, reflect in lack of color and texture uniformity in the baked goods.

Job for Controls

Records of the temperature across the combustion space and below the radiant heating tubes explore this uneven heat pattern. They show that the space is hottest at the center. On-off control accentuates this, because the lengthy periods of burner-on build up heat in the center tube.

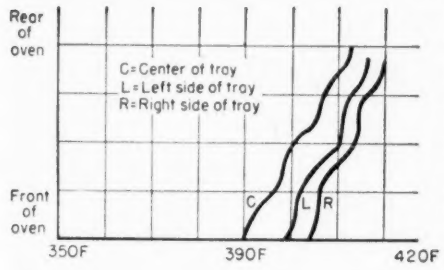
After seeing these test results, Schaible's decided that a more advanced control system was needed—but wanted it simple as well as inexpensive because, like most other firms in this field, it hasn't any trained instrument men on its staff. Accordingly, a simple electronic resistance thermometer controller was installed.

Nonetheless, it was recognized that a complex regulating situation was faced—bearing on fact that full flame is necessary to uniform heating of the radiant tubes, and throttling the flame would therefore not work.

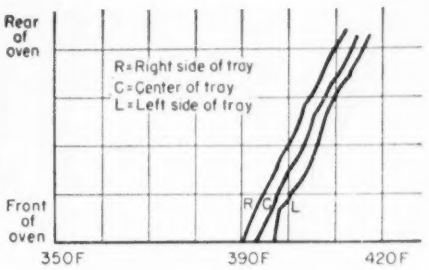
The answer proved to be a unique kind of control action involving the Electromax Duration-Adjusting Type Controller—or D.A.T. This instrument varies the ratio of on-time to off-time in accordance with deviation of the actual temperature from the control point to obtain what engineers term proportional control.

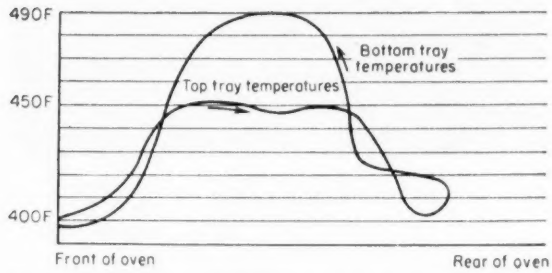
Selection of this electronic bridge-type controller permitted use of a temperature-sensing element that solved another problem in the oven. Since heat distribution is inherently uneven across the tray traveler, a thermohm detector (resistance thermometer) could be placed in a long protection tube across the oven at its hottest sector and thus reflect an

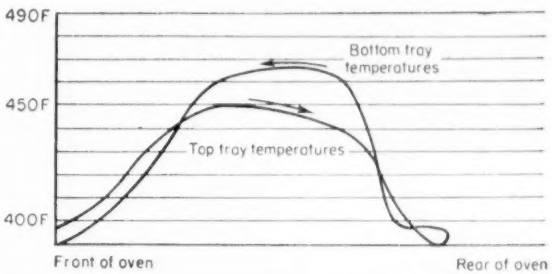
Test Data Show How



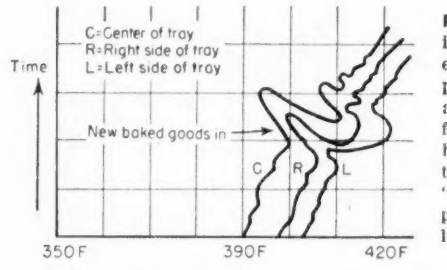
CONVENTIONAL "on-off" control shown in graph at left produced wide temperature gradients across trays, resulted in uneven bake. Graph at right shows how new controller has narrowed across-tray temperatures and removed "wiggles" from process.



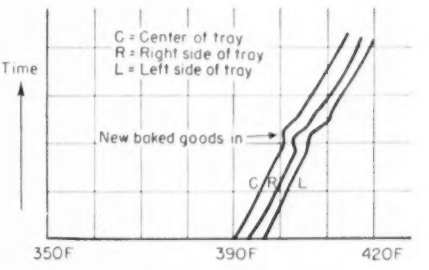




PILOT TESTS on traveling-tray oven with conventional cycling control showed wide disparity between top and bottom temperatures, as shown in graph at left. Analysis in graph at right shows new controller has acted to unify temp.



PLACING of new goods into test oven caused the erratic across-tray temperature cycling shown at left. But as seen right, fresh batches, different batches, or varying quantities do not result in a "flash heat" when proportional-impulse controller is on job.



average heat across the chamber.

Actually, this D.A.T. installation consists of an indicating, non-recording controller with an electronic bridge circuit of simple design. An electrical relay is its only moving part.

A knob on the instrument door permits easy selection of the control temperature, which is then held automatically. When changes of 0.5 deg. F. below the control point occur, a green light on the door flashes, while a red light shows any increase of 0.5 deg. F.

Exact oven temperature can be checked at any time by snapping a switch on the controller door, turning the front-set knob if necessary, and reading the scale value at which both lights go out. At Schaible's, the unit is mounted at the left front of the oven to keep the baker readily informed of oven conditions. Also, a separate light—mounted above the controller—indicates whenever the oven burner is full-on.

The thermohm temperature detector used with the controller consists essentially of an accurately calibrated platinum resistance winding inside a stainless steel protecting tube. Resistance of this sensitive element decreases or increases as oven temperature rises and falls.

Since the resistance element protection tube is 36 in. long, any difference in temperature across the oven tends to "average out". The resistance of this winding is introduced into the bridge circuit of the controller by means of three-conductor leadwire.

A change of 0.5 deg. F. in the "average" oven temperature results in a voltage imbalance, which is amplified to produce a control signal. The controller then proportions fuel oil input at the burner in accordance with the new heat demand. It does this by changing the ratio of time during which the burner is full-on to the time during which the burner is full-off.

Distinctive feature of D.A.T. is that the proportional on-off action continues uninterruptedly; it is only the ratio of on-time to off-time that changes. And this ratio is proportional, at any time, to the actual deviation of temperature from the control point.

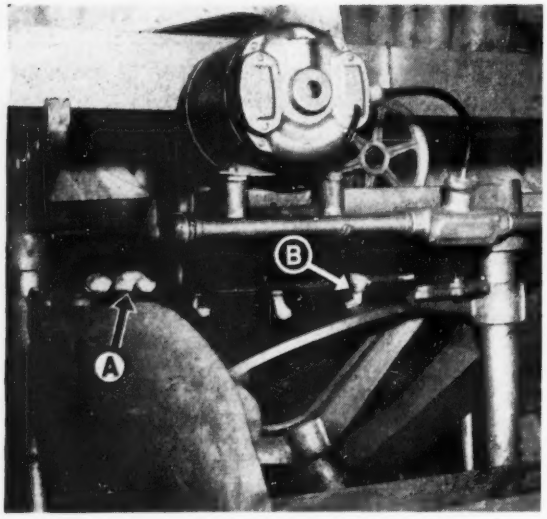
Automatic Re-Set

In addition to proportional action, the controller provides automatic re-set—a forced movement of the process back to the control point—which is "tuned" to the product being run. Thus, varying moisture content of the baked goods is compensated by further adjustment of the on-off ratio. The rate of this corrective adjustment depends on how long the temperature is off the control point.

An inherent degree of rate action is also provided in the instrument. This function changes still further the on-off time ratio in accordance with the speed at which oven temperature may be changing. It helps return temperature to the control point without overshoot.

(Turn to page 150)

SPECIAL cutting machines snip off roots, sever buttons from stems. Speed: 100 mushrooms per min.



CLOSEUP of cutter. Buttons snipped (A) drop in flume. Stems are then cut from roots (B).

10 Steps to Food Processor's Pinnacle . . .

Quality at a Fast Pace

For quality: Mushroom canner (1) keeps product moving, (2) does multiple grading, (3) inspects repeatedly, (4) employs flumes, (5) uses cook check. For fast pace: Plant has (1) automatic cutters, (2) slicers, (3) mushroom pump, (4) choppers, (5) screw blanchers, and (6) magnetic retort loader

JOHN V. ZIEMBA
Associate Editor, "Food Engineering"

When Brandywine Mushroom Corp. started operations 25 years ago in West Chester, Pa., first plank nailed to its success platform was to pamper its mushrooms from cultivation to canning.

By hammering away at this policy, top management has been able to set up rigid quality-control measures as well as develop highly efficient processing units and techniques to assure canning of mushrooms at the peak of perfection. Too, repeated grading and inspection methods have resulted in uniformity in the size of products canned.

First quality-control step is picking mushrooms with roots attached and while the veil is still firm. Mushrooms picked in this manner retain their freshness. And since the butt end is not cut, there is no chance of objectionable discoloration.

Gathered in nearby company-owned growing houses, the snowy white mushrooms are whisked within 2 hr. to the spotless, highly efficient cannery to be speedily processed within the same day.

To insure the higher degree of quality demanded by company standards, sample batches of each new crop are laboratory-checked for spots, blemishes, and other possible defects.

As a further safeguard, 10-lb. baskets of freshly picked mushrooms are stored in two 34-deg. F. rooms. Here, baskets are carefully stacked, 128 to a mobile rack to permit rapid air circulation and cooling. One 12x40-ft. room holds 27 racks, and the other 12x25-ft. room handles 9 racks.

These rooms are cooled by blasts of blower-driven air across self-defrosting, Freon-refrigerated, fin-type coils suspended from the ceiling. Cooling of the mushrooms—from room temperature to 34 deg. F.—takes place within 2 hr.

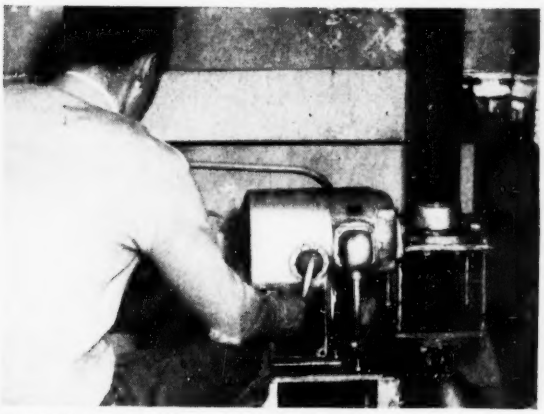
As needed, racks of mushrooms are removed from cooler storage and rolled over a floor-level scale in the receiving room. At this—the first in-plant inspection point—mushrooms are thoroughly checked for bruises, broken veils, discoloration, and insect damage. Careful inspection at this stage speeds checking at other quality-control points along processing lines.

Baskets of mushrooms are now transferred to roller-wheel conveyors above each of five highly efficient cutting lines. Below each conveyor,

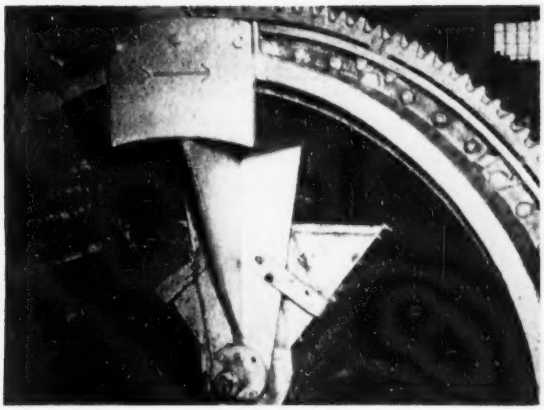
Operation Mushroom

Close-focused Brandywine operation—from growing to canning supervision—is graphically detailed in this month's FE Picture-Flowsheet. Titled "Modern Mushroom Canning," it includes an array of 14 key-point photos. **See pages 120-123.**

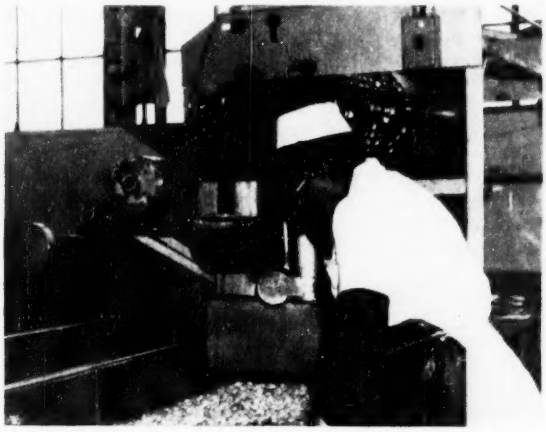
New Techniques Assure Efficiency



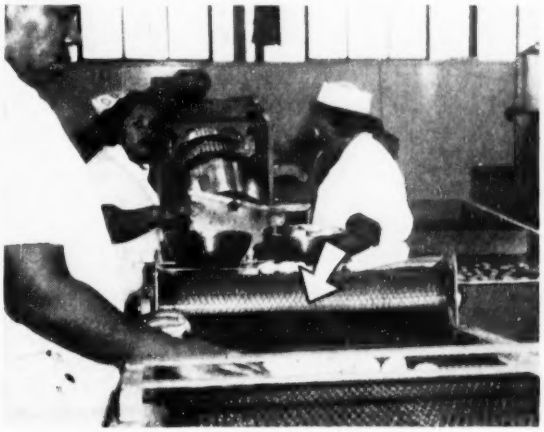
BLADELESS PUMP carries stems and pieces undamaged from inspection line to grading reels.



SCREENER removes dirt and other foreign matter from flume water, which is then re-used.



CHOPPER was developed in company machine shop. It's specially built to avoid mashing of stems and pieces.



FROM GRADER (rear), buttons drop on inspection belt. They are flipped over (arrow) for re-inspection.

catch-pans collect any dirt falling from the roots.

Installed on each line are ten company-designed cutting machines, which have abolished the costly manual method. Each machine cuts and separates buttons and stems from roots at the rate of about 100 mushrooms per min.

How Mushroom Cutters Work

Cutting is in this manner: Mushrooms are inserted button-side up into 18 V-shaped slots on a horizontal rotary disk. As the disk makes about a quarter turn, a stationary knife cuts off the buttons. A horizontal plow then sweeps them into an 8x30-ft. flume containing about an inch of water.

While making about another half turn, stems and roots are elevated to a predetermined height by an arched planetary disk. Mounted on about a 45-deg. angle, speed of this disk is synchronized with the one carrying stems and roots. A second knife severs the stems, which are also plowed into a second flume. Meanwhile, roots drop onto a canvas-belt conveyor that feeds them into receptacles for disposal.

Both flumes serve two purposes—to wash and to move buttons and stems to processing lines.

Water is pumped from two 200-gpm. wells through a 6-in. pipe feeding five 2-in. lines. Each line, in turn, supplies water to stem and button flumes.

All flume water is screened for reuse. Employed is a 5x8-ft. fine-mesh screener that removes dirt and other foreign matter. Debris drops into a trough inside the screener, and a worm screw then discharges the dirt into a receptacle.

Cut mushrooms are not permitted to lie around. Workers operating the mechanical cutters make a lunch break 15 min. ahead of those farther along processing lines.

Buttons are mechanically graded and later processed on two lines—one for buttons of uniform sizes and the other for slices. Stems, on the other hand, are flumed to a third line to be processed into stems and pieces.

Advanced Process Lines

Let's now follow the three processing lines, beginning first with the buttons. Flumes from the five cutting lines carry buttons into an 8x30-ft. master flume that feeds them into a 6½-ft. long rotary grader. This grader has 1¼-in. and ⅝-in. perforations at the feed and discharge ends of the unit. Along the top of the grader a stationary water spray washes the mushrooms as they are sized.

Small buttons passing through the grader are carried through a 30-ft. enclosed flume, which is equipped with a series of high-pressure water sprays. They are then discharged onto a 20-ft. roller conveyor where

ten girls carefully inspect them. Non-usable buttons are discarded. Those with broken veils are fed into a flume that carries them to the adjacent stems and pieces line. Buttons passing inspection are discharged into a 30-ft. flume with high-pressure sprays. A wire-mesh flight conveyor now elevates the buttons on their way to a 25-ft. underwater grader.

Here, buttons are mechanically sorted into seven sizes—½, ⅝, ¾, ⅞, 1, 1⅛, and 1¼ in.—and collected in 3x4-ft. stainless steel tanks with 2½ ft. of water. The largest buttons (1¼ in.) are fed to the sliced mushroom line, and the remaining six sizes are introduced into the hopper of a specially designed continuous blancher.

Screw-Type Blanchers

The new 1x10-ft. Reitz Thermascrew blanchers (FE Sept., p. 86) reportedly increase production and improve quality. There are three blanchers for buttons, slices, and stems and pieces.

Steam is fed under a pressure of 5 psi. through jets into the hollow shaft of the screw and into the shell of the blancher. Since heat is uniformly distributed, buttons are thoroughly blanched as the unit handles capacity loads. Between flights, stationary agitator bars tumble the buttons while they are being blanched. Blanching time, which varies from 3½ to 5 min., is controlled by a variable-speed drive.

Attached to the main steam line is a reducer that lowers the pressure to 5 psi. Hooked up with the lower pressure line and the rotary shaft of the Thermascrew is an 18-in. flexible metal hose designed to take up any small misalignment of the shaft.

The amount of condensate accumulated is controlled by a drain opening at the higher feed end of the blancher. And the amount of steam used is controlled by the number of jets that are opened.

Given a 3½-min. blanch, buttons now travel over a wire-mesh conveyor. Here, they are examined, and those with open veils are introduced into the stems-and-pieces line. Farther along the line, buttons flip over as they drop 6 in. over a metal plate set at a 45-deg. angle. Buttons then travel on another wire-mesh belt for still another inspection. Formerly, they were manually turned over by inspectors—a method that was not too satisfactory.

Because of possible shrinkage during blanching, buttons are again graded into seven sizes. Passing through a rotary grader, they drop into stainless steel troughs with hand-operated bottom gates. From here, the different sizes are loaded into 40-lb. capacity, stainless steel trays mounted on a mobile rectangular metal frame. Buttons are then transferred into 13 stainless, bottom-perforated filling troughs (1½x4 ft.). Here, they are filled and weighed into 2-, 4-, 8-, or 16-oz. cans.

Back at the first grader adjacent to the cutting lines, large buttons (over 1¼ in.) are discharged onto a 1½x10-ft. wire-mesh inspection belt. Here, inspectors sort out discolored buttons, which are later trimmed and introduced into the stems and pieces line. Farther along the conveyor, they are automatically flipped over for a second inspection.

These large buttons are now flumed to a second grader (8 ft. long) that separates them into three sizes. Buttons are collected into 5x6-ft. stainless steel tanks with a 2½-ft. water level. The two smaller sizes—1¼-1⅜ in. and 1⅜-1½ in.—go into the sliced pack, and those over 1½ in. are packed as jumbos.

The jumbo buttons are continuously blanched about 5 min. in a second blancher. From the blancher, they drop onto a short inspection belt with overhead stationary water sprays. Passing inspection, the jumbos are collected in 20-lb. capacity, stainless perforated trays and transferred to the filling line.

Blanched buttons that are to be packed as slices are fed onto a 4-ft. wire-mesh inspection belt. Those buttons with broken veils are removed and introduced into the stems and pieces line. Again to insure thorough inspection, buttons are flipped over as they drop over an angle plate and onto another wire-mesh conveyor.

Rotary Slicer; Bladeless Pump

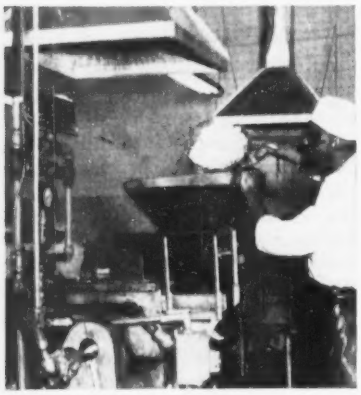
Next, the buttons travel along a 1x4-ft. rubber belt with an overhead stationary water-spray pipe. Buttons are then fed to a 48-blade rotary slicer that cuts them into ⅜-in. slices. A vibrating, perforated chute carries the slices under a water spray and into stainless steel, perforated trays. They then go to the filling line.

Now to the stems and pieces line. Stems are collected from the five cutting lines into another master flume that feeds a 2x4-ft. rotary washer with overhead water sprays. Cleaned stems now drop into a 30-ft. flume with high-pressure water sprays. They then continue onto a 20-ft. wire-mesh belt for inspection.

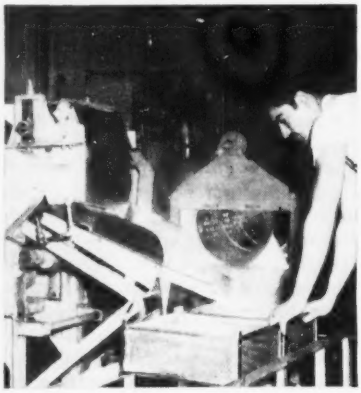
Stems then fall into a 1x1½x4-ft. stainless steel surge tank. From here, a Fairbanks-Morse bladeless impeller pump carries the stems through a 4-in. pipe to a grading reel. Equipped with a revolving helical tube in place of conventional blades, this pump moves stems without bruising them. What's more, less water and only a 5-hp. pump are required. Too, stems are washed as they are pumped.

Extremely small pieces pass through the grader and into a flume to be discarded. Remaining stems and pieces continue through a company-designed chopper. Here, a rotating slotted pad-

(*Turn to page 139*)

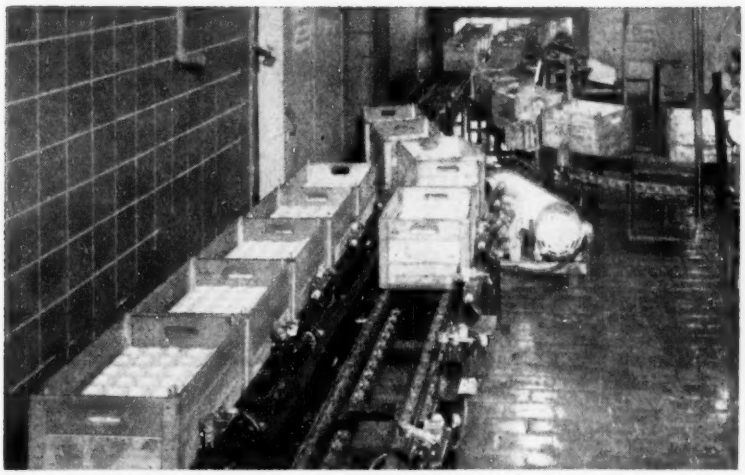


CONTINUOUS BLANCHER replaces basket-type unit. Mushrooms are steamed while gently screw-conveyed.



SLICER also is specially designed. Attached to blancher, it rapidly slices buttons, which fall into tray.

LOADING of cans into retort crates is simplified with electromagnetic carrier with retracting pulley.



No. 1 & 2 "COMBINERS" assemble cases of identical products and carton sizes in groups of five—release them on main-line conveyor.

NO. 3 COMBINER releases cases (groups of five) to one elevator leading to overhead accumulator-conveyor.

Case-Handling Hurdles Cleared by *Automation*

Streamlined system built around automatic stackers speeds western dairy's output, saves $40,000 yearly on labor . . . And if you, too, are a "case and carton" operator—brewer, bottler, canner or meat packer—you might well explore the possibilities of this type line for benefitting your own handling

JOHN SHINN
McGraw-Hill News Bureau, Los Angeles

Tough case-handling problems have now been solved by automation—involving a new, skilfully integrated conveyor and stacking system—at the Slauson Avenue plant of Arden Farms Co., Los Angeles, largest distributor of dairy products west of the Mississippi.

This new installation stands as a striking example of cooperative engineering in which food plant engineers work with equipment manufacturers to a common end.

True, milk now moves in a near-continuous flow from dairy cow to package. Held for only short periods in stainless or glass-lined tanks or tank trucks, it is then pumped through the process to the bottling machines. Here, however, the high degree of mechanization ends—and the case difficulties in question begin.

Specific troubles that plagued Arden's production department, centered in the handling of cases from fillers to delivery trucks. At this plant, all milk is packaged in paper cartons, hand cased and conveyed to loading.

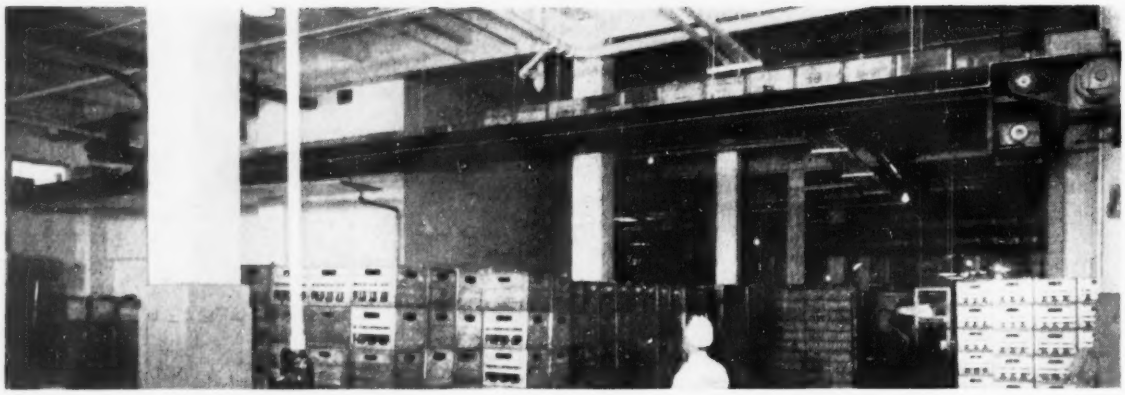
With the old system, cases weighing 72 lb. were then stacked five high by hand. This backbreaking job soon resulted in fatigue and men were prone to rough swinging of the cases to the stacks. Such handling often damaged cartons, which eventually became "leakers." Despite all efforts, it was practically impossible to provide a continuous flow of filled cases to trucks. And if there was any interruption in truck-loading, the short conveyor lines to the truck dock had to be stopped, creating a bottleneck.

Major reason for mechanizing this line was, of course, to streamline production. But other benefits accumulated rapidly from this new line that Arden specially designed around two automatic case stackers furnished by Food Machinery & Chemical Corp.'s Packing Equipment Division.

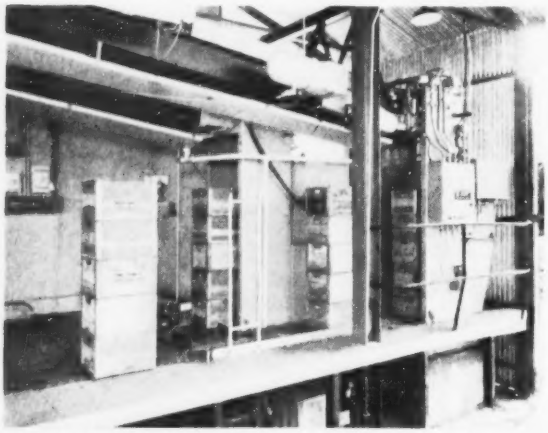
The stackers relieved eight men (in two shifts) from the line and resulted in a year labor saving of $40,000.

While Arden has no solid figures on savings accruing from the elimination of leakers, this also is regarded as one of the most important results of the new system. Further, company engineers estimate that bottling efficiency, in terms of units per man-hour, has increased about 10 percent.

Exact figures of man-hours saved in truck loading are not yet available. However, it is known that all employees are happier now that they don't have to man-handle the heavy cases.



TWO drive motors (upper right) power two sections of accumulator conveyor. Overhead conveyor saves space.



CONVEYOR (top) feeds the two stackers with cases, which emerge on floor conveyor in five-high stacks.

TRANSFER unit automatically shuttles stacks from left stacker to main-line conveyor.

The new setup comprises six paper-carton filling machines, three "combiners" (case-grouping elements), two stackers, two elevators, and some 1,585 ft. of conveyor. Of the fillers, one is a standby. Two are for pints and half pints, which are hand-cased and conveyed to combiner No. 1. Two other fillers supply quart cartons, which are cased and conveyed to combiner No. 2. Combiner No. 3 switches cases from No. 2 onto the same line with No. 1 when it is desirable to use only one stacker. When half-gallon cartons are packed, they move on a separate conveyor.

Purpose of the combiners is to assemble cases containing the same sizes and types of products in groups of five for automatic stacking. This is done as the cases are conveyed from the filling room.

Operation Details

The three combiners, each made up of two accumulators, are operated by an interlocking electric circuit. Each accumulator has an air-operated stop-bar at its entrance and exit. As the first case enters, it strikes an exit stop-bar and depresses a limit switch, located on the side of the conveyor. The following four cases move into the unit, and each one depresses a limit switch. When the fifth limit switch is actuated, the exit bar is automatically depressed and the entrance bar is closed. At the same time, the exit bar of the other accumulator is closed.

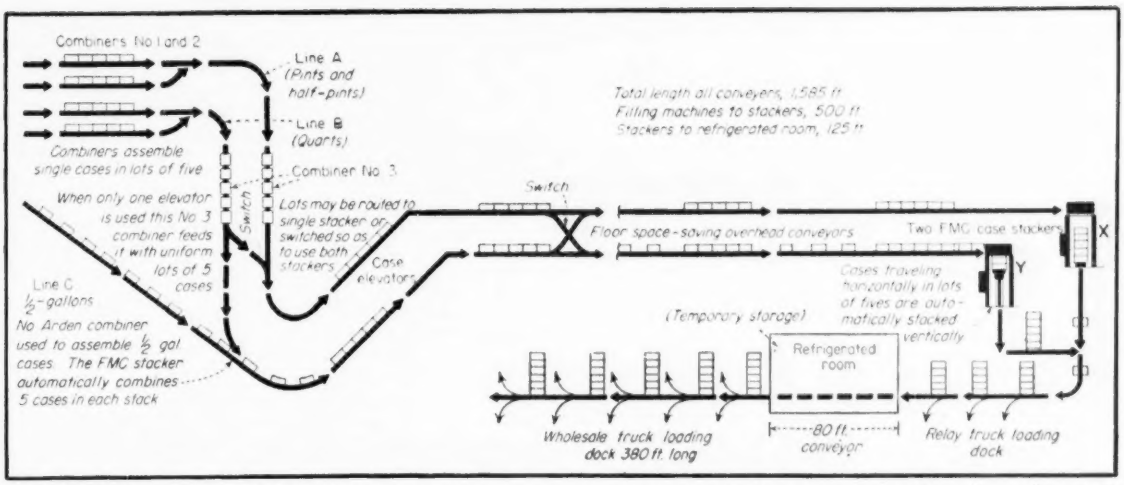
While being held stationary by the stop-bar, the cases slide on the continually operating chain conveyor. As the exit bar is removed, the cases begin to move out.

When a group of five cases has cleared the limit switches and exit bar, the system automatically opens the entry and closes the eixt to the first accumulator and, at the same time, releases the exit bar of the other accumulator in this combiner. Thus the two accumulators provide an alternating, yet continuous, flow of cases to the main line.

Stops are metal bars located in the center of each conveyor line. They normally engage a case at its leading edge as it approaches the accumulator. However, if case No. 6 so closely follows No. 5 that the bar cannot engage the leading side of No. 6, it will engage the bottom edge of the following side.

Limit switches are spaced so that no one case can depress two switches at once. This eliminates the possibility of the unit releasing less than five cases in a group.

Combiners No. 1 and 2, located in the filling room, feed to combiner No. 3. In normal operation, No. 3 switches the cases from No. 2 onto the same line with the cases from No. 1. These move to a single case stacker. If desired, the cases from No. 2 may be routed directly to the second case stacker. However, when cases of half-gallon cartons are being packed, this second stacker


Combiners No 1 and 2
Line A
(Pints and half-pints)
Line B
(Quarts)
Combiners assemble single cases in lots of five
Combiner No. 3
When only one elevator is used this No. 3 combiner feeds it with uniform lots of 5 cases
Switch
Lots may be routed to single stacker or switched so as to use both stackers
Case elevators
Line C
½-gallons
No Arden combiner used to assemble ½ gal cases. The FMC stacker automatically combines 5 cases in each stack
Total length all conveyers, 1,585 ft.
Filling machines to stackers, 500 ft.
Stackers to refrigerated room, 125 ft.
Switch
Floor space-saving overhead conveyors
Two FMC case stackers
X
Y
Cases traveling horizontally in lots of fives are automatically stacked vertically
(Temporary storage)
Refrigerated room
80 ft. conveyor
Wholesale truck loading dock 380 ft. long
Relay truck loading dock

CONTINUOUS flow of stacked cases from milk-fillers to trucks is provided by conveying-stacking line. Two automatic stackers ("X" and "Y," far right) operate, respectively, at rate of 20 cases and 6-7 cases per minute.

is used only for the stacking of this larger size container.

The conveyor system is comprised of a number of shorter conveyors that make this an "accumulation line". Each of these shorter sections is powered by separate motors and controlled by a separate switch.

The length of the line in itself provides a reservoir of cased product. However, there is additional ability.

As an example: If the flow of stacks to the loading dock is more than can be handled by the drivers who are loading at that time, then the conveyor stop-cord (which is strung along the dock) is pulled. This stops the dock conveyor. However, the remainder of the system remains in operation, gradually shutting down. The case stackers are the first to stop. Then, as each short section of conveyor is filled, it is stopped by a limit switch.

Capacity of the accumulation line has been sufficient to handle all emergencies. So far, no jam-up has reached as far back in the line as the fillers.

Filled cases travel overhead through the plant approxi-

DRIVER of relay truck selects products and slides stacks into truck. Steel floor eases sliding.

ENROUTE to dock, stacks move through the steel-floored refrigerated room. Designated products are temporarily stored here. Floor-level conveyor saves fully 25 percent on floor space in room.

THIS 380-ft. chain conveyor moves cases along dock, where Arden drivers easily slide stacks into their trucks. Emergency cord (strung to posts, right side of dock) is pulled if there is need to stop conveyor.

mately 250 ft. to the location of the automatic stackers. This overhead arrangement frees floor space for other operations.

The automatic stackers accept five cases and "down-stack" them vertically. Since cases in the accumulation line have already been arranged in groups of five, they will enter the stackers in this order without any mixing of cases of different carton sizes.

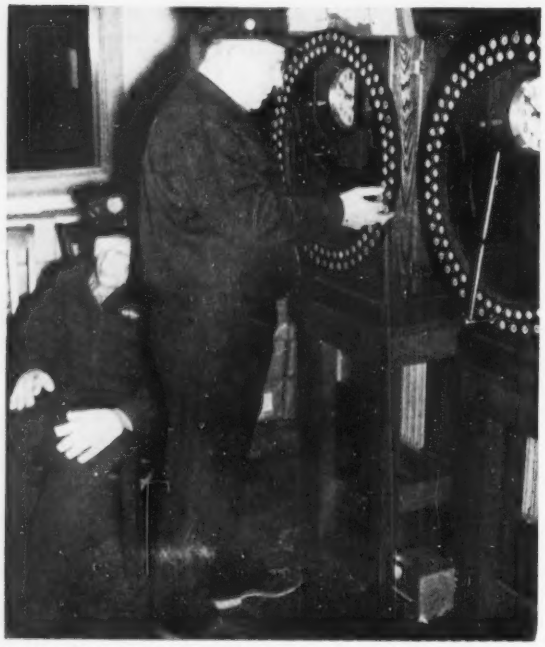
These electrically powered, hydraulically operated FMC stackers have a rated capacity of 23 cases a minute. Being adjustable, they will stack cases to any practical height. Manual stacking was the major cause of "leakers." And, of course, the stackers eliminate the back breaking job of tiering 72-lb. cases to a 60-in. height.

In this line, stacker X (see drawing) operates at a capacity of about 20 cases a minute and stacker Y at 6-7 cases. Stacker X is connected to the main-line conveyor, whereas stacker Y feeds stacks to an Arden-developed automatic stack-transfer device, which combines the load from each stacker onto a single conveyor chain.

How Stacker Operates

In action, the conveyor feeds the first case to a stacker. As the hydraulic elevator lowers this case, a stop bar

(*Turn to page 148*)



HERE, MR. X sits "modeling" an eye accident—and goes into pertinent "vocal" details about it whenever a worker steps up to the clock.

Talking Dummy

Sells Workers on Safety

A LIFE-SIZE dummy—dressed realistically in full worker's uniform—is doing a lot to help cut accidents at Griesedieck Brewery, St. Louis.

He's not a mute figure, either, for a recording-tape message repeater is employed so that he "has his say." And a very effective say, too.

How this novel "Mr. X" dramatizes management's program is revealed by Robert A. Griesedieck:

"This surprise-type exhibit strikes with hammer-home impact. Impressions created are embedded in the worker's memory, especially since the dummy wears the distinctive employee uniform. This is how we use 'him':

"During a week-end, we 'stage' the dummy in the department where the last accident occurred, endeavoring to place him at the spot and in the position of the injured worker at the time of the accident.

"As near the scene as possible, we place an automatically tripped message repeater that seemingly speaks from the dummy, describing the accident, admonishing the careless, and suggesting how such an accident can be avoided in the future.

"Invariably, when employees report on Monday morning, they gather about the silent dummy. One of them is certain to step on a floor mat covering the starter-switch of the tape play-back. The dummy immediately tells them off, repeating details of the accident and adding pointed comments. And he repeats whenever the mat switch is tripped.

"This kind of accident warning gives liveliness and force, providing both collective and cold realization that lingers in the memory for days. Also, witnesses convey details, often enlarged in retelling, to fellow workers in other departments, thus spreading accident awareness throughout the entire plant. Value of the pass-along is obvious. Laxness begins when workers stop talking safety.

"Staging the talking-dummy act can be equally effective during those welcome lulls between accidents. In one such period, our dummy drove home convincing lessons of the grave danger of eye accidents, and suggested adequate precautions.

"In this instance, we had 'him', with one eye bandaged, slumped in a chair beside a time-clock (see photo). Workers actuated his talk-switch by stepping on the mat before the clock, whereupon 'he' lamented his half blindness, warned of the risks, and spoke out on the preciousness of full sight."

Press for Repeats

Did all this register with the workers? Decidedly. They lingered to hear the warnings repeated—intentionally tripping the message into action.

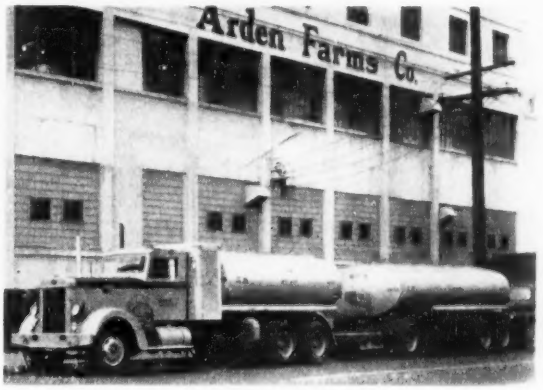
The dummy is not always requisite to the effectiveness of the message repeater. The latter is a worthy tool by itself, most valuable when operated from a hidden source. Proof of the merit of such vocal messages "out of the air" was established when, without other aid, 'the voice' ended horse-play which had sprung up in the drayage department and had been the cause of several avoidable mishaps.

Emanating from "somewhere in the order room," three different announcements on consecutive days struck home in counseling the employees. So convincing were these talks that workers made a point of reporting to supervisors their innocence of participation in the rough-housing.

In short, this kind of lesson is double barreled in effect—both stopping hazardous practices and increasing worker awareness of accident dangers. Moreover, it convinces employees that management is constantly aware of them, always observant, and determined to attain maximum employee safety.

WINE "dropped right from curb" . . . quickly, economically

GRAPE JUICE picked up



LIQUID SUGAR off

Truck Tankers—*Versatile-Plus*

In Carrying Liquid Foods

ABILITY of motor tankers to distribute a wide variety of liquid foods in bulk is shown in recent movements in which grape juice has been hauled on the outgoing trips and wine on the return runs. And this transport is now continuing.

The grape juice moves south from Grandview, Wash., 934 miles to the San Francisco Bay area, while the wine travels 856 miles north from Delano, Calif., to Portland, Ore. Running and elapsed times south are 26 and 29 hr., respectively; north, 25 and 28 hr. Two drivers are carried to conform with Motor Carrier Bureau driving regulations.

Hauler is the Arrow Transportation Co., Portland, and the food processors are the New Italian Importing Co., of the same city, and the Welch Grape Juice Co., Grandview, Wash.

For its diversified liquid food haulage, Arrow has special motorized equipment, the unit employed being a $40,500 truck-trailer train made up of a six-wheeled truck pulling a six-wheeled trailer (seen in third photo above).

Both truck and trailer carry insulated stainless steel tanks. The one in the truck has a capacity of 2,957 gal. and that in the trailer 4,214 gal.—total 7,171 gal.

Each tank has three separate compartments, making six in all. Their individual capacities range from 662 to 1,586 gal. Thus the shipper may vary the products in different compartments. Also enabled are part-load deliveries to from one to six customers.

All of the tanks are insulated with 2 in. of Fiberglas and covered by aluminum shells. Each tank is also coated with Tropolite (a phenolic protective covering made by Tropical Paint & Oil Co., Cleveland) to assure sanitary washings between diversified loads.

Arrow is currently operating two of the stainless steel units and three plain steel units, all Tropolite-coated and all hauling bulk food products. The company also has under construction

(*Turn to page 198*)

Solids are fed to processing either by volume . . .

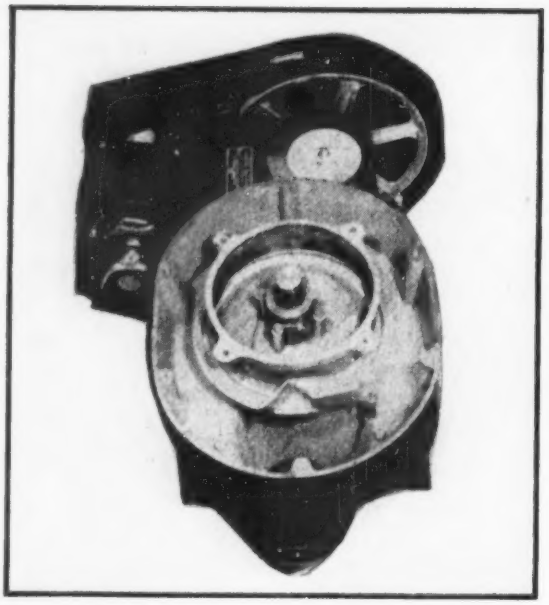


FIG. 1. Disk feeder comprises grooved plate and plow. Grooves are filled from hopper, struck off level as they emerge from beneath it, then emptied by plow.

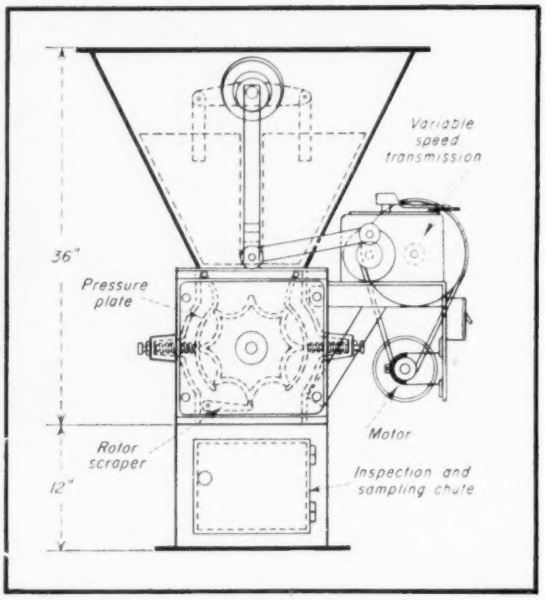


FIG. 2. Rotary feeder consists of drum with series of equally spaced pockets. It is mounted below a hopper and between spring-loaded plates.

CONTINUOUS PROPORTIONING

Catalyst of the Automatic Plant

It makes possible accurate compounding of food products regardless of characteristics or number of ingredients involved. By eliminating batching kettles, it enables increased output and reduction in labor

LAWRENCE LOWY,
Sales Engineer, Builders-Providence, Inc., Providence, R. I.

Just as a super-highway efficiently circumvents the bottlenecks of cross-traffic, so too—in effect—does continuous proportioning of ingredients in the food plant. For this advanced technique similarly surmounts the laborious, time-taking involvements of the traditional "start-stop" kind of processing.

Thus, modern-engineered means of apportionment have already proved of value in many branches of the industry. And they are finding more applications daily—ranging from such simple operations as addition of liquid or dry vitamins in continuously moving streams of fruit juices or alimentary pastes to such intricate formulations as prepared mixes and animal feeds, which may require as many as 100 different ingredients.

Trouble has been that the old methods of proportioning have involved uses of batch tanks or kettles in strictly intermittent operations, even though, given enough tankage, feeding and metering could be ramified into some sort of continuity.

► In contrast, the new techniques streamline the flow, increase output, improve uniformity of finished product, and reduce labor.

Since the end of World War II, high labor costs have accentuated the demand for accurate, automatic, dependable, and rugged machinery to supplement or even eliminate manual labor. Such equipment was needed to insure a product of uniform quality on an economical basis.

Instrumentation, metering, and blending equipment fulfilling such requirements has met these needs, and return to a competitive market has acted as the catalyst to bring together the two elements of economy and automatic control.

More and more, industry is swinging toward the fully automatic plant in which the labor force is small and production is streamlined. There are already many installations to demonstrate this fact and to prove it is economical.

Now let us consider the feeding and metering equipment available. There are many forms in which the materials to be compounded can be fed—dry, in solution, as a concentrated liquid, in a dilute form, as a semi-solid, as a gas, and so on. Once the form has been decided, the proper feeder can be

. . . or by weight

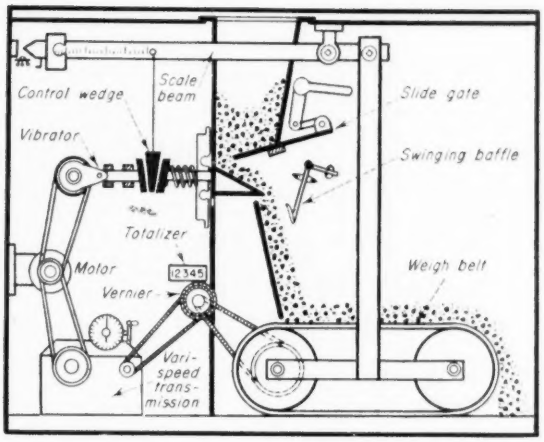


FIG. 3. With weigh belt feeder, material flows from hopper through adjustable shut-off gate to vibrating tray, then discharges to short, scale-suspended belt. Rate of feed is controlled by speed of tray vibration.

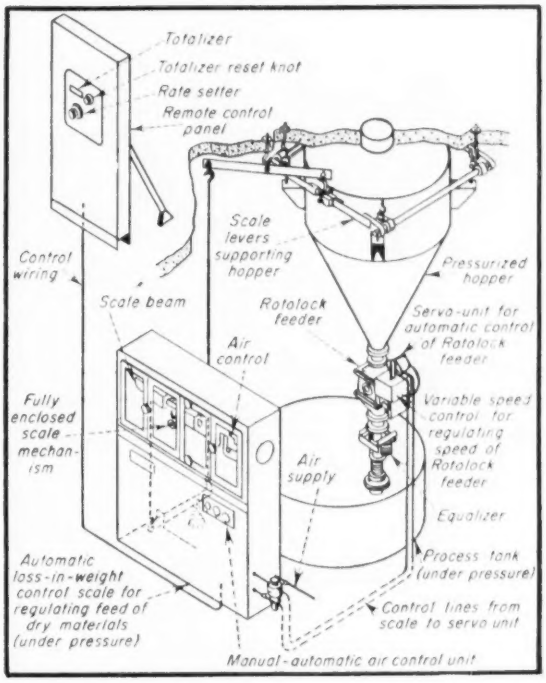


FIG. 4. Loss-in-weight feeder employs scale-mounted hopper emptied by mechanical vibrator. Movement of scale beam varies amplitude of vibrator to bring scale back into balance.

selected to proportion each of the specific components.

One important factor is the matter of accuracy required, for accuracy limits are often too rigidly defined. In fact, they are set much closer than production, or in some cases even laboratory tests can discern. This is an important point and should be given more than brief consideration. It may easily sell or defeat any continuous-flow project with top management if costly equipment has been figured whereas less costly machinery could do the job.

Many Units Available

Feeders can be classified as volumetric or gravimetric. For handling solids there are many types within these classifications. One author has listed the volumetric types in groups which push or carry, trap and carry, throw or fluidize.

The carry type feeder shown in Fig. 1 consists of a grooved plate and plow. The groove is machined to a known capacity per unit of length. It is filled from the hopper above, then struck off level with the surface of the disk as it emerges from beneath the hopper. This unit is probably the most accurate of all continuous volumetric measuring devices. The plow is shaped to closely fit the groove, thereby removing all the material as it revolves. Delivery is directly proportional to rpm.

Capacities range from a fraction of an ounce to 400 oz. per hr. This makes the unit ideal for adding powdered vitamins to such items as spaghetti and macaroni. Each unit has an adjustable capacity range of 100:1.

Errors in feeding dry materials by volume are mainly due to compressibility of the product. In the above disk feeder, hoppers and grooves are fairly shallow. Therefore a non-compressible material can be fed with accuracy plus-or-minus 1 percent by volume or plus-or-minus 3 percent by weight. For greater capacities the groove is omitted and various plow widths or orifices are used between disk and hopper underside.

The rotary unit shown in Fig. 2 is a volumetric solids feeder of the trap and carry type. It consists of a drum with a series of equally spaced pockets around the periphery. Drum is mounted below the hopper and between spring-loaded pressure plates. Feed rates are proportional to rpm. of the drum. Rotors of varying pocket design provide for different materials and rates of feed.

Outside scrapers or inside metal balls are used to remove material that may stick to rotor after discharge. Compressibility and particle size of material will affect the accuracy of this type of feeder to a greater extent than the disk type. Usually, accuracy figures can be accepted as plus-or-minus 5 percent by volume. Ranges go from less than 1 to as much as 300 cu.ft. of material per hour.

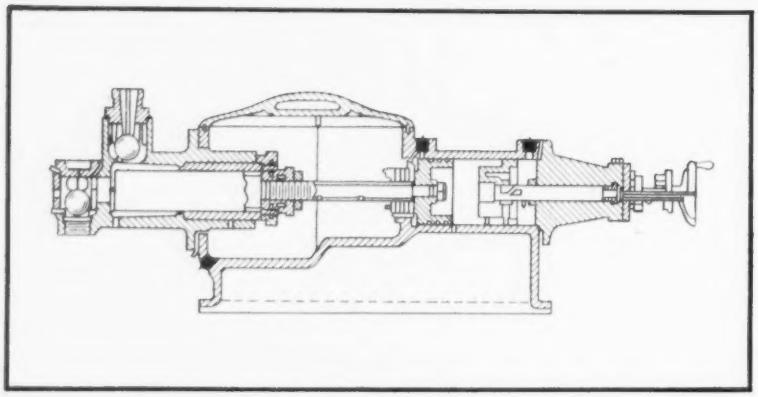
Weigh Type More Accurate

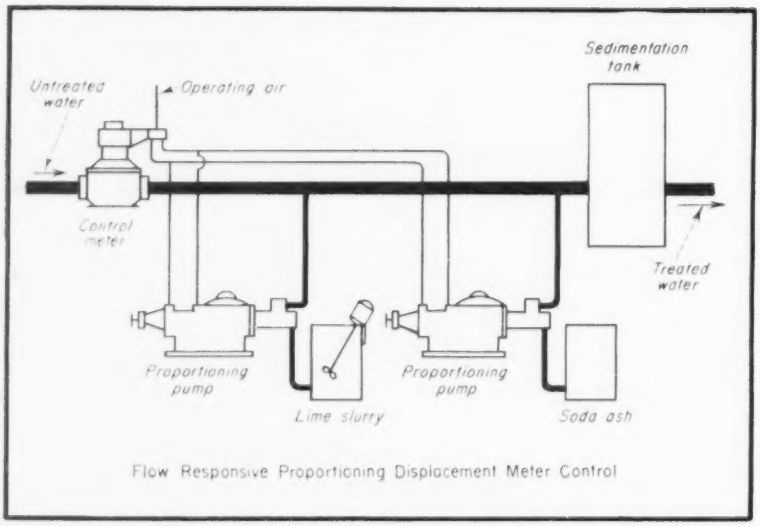
Gravimetric or actual weight feeders are of such types as weigh belt, weigh into hopper, and loss in weight. Fig. 3 shows a weigh belt type suitable for feeding 500 to 20,000 lb. per hr. Material flows from a small hopper through an adjustable shut-off gate to a vibrating tray. This tray discharges to a short endless belt suspended from scales and maintained at constant weight. Vibrating movement of the feeder tray is imparted by a cam-operated oscillator, through a free-hanging wedge-shaped rubber bumper.

When beam and wedge are lowered because of insufficient weight of material on the belt, feeder tray vibration is increased. Too much belt weight tilts the beam and wedge up and decreases the feed. Changes in feed rate are obtained by adjusting variable speed transmission to drive belt at desired speed.

To prevent flooding, an automatic solenoid-controlled air cylinder operates an adjustable gate immediately above the oscillating tray. Solenoid is controlled by two mercury switches, one operated by the swinging baffle should too much material discharge from the tray, and the other operated by the scale beam should a serious belt overload cause the beam to tip up

Pumps Meter Liquids Efficiently





FIGS. 5 & 6. Top: Positive displacement pump easily adapts to automatic control. Above: Schematic of use in water-treating system.

sharply. Instead of the automatic shut-off, a rotary pocket feeding mechanism can be installed above the tray. This offers a positive non-flooding arrangement. Accuracies of plus-or-minus 1 percent can be expected for this type of feeder.

Another make of weigh belt feeder utilizes a variable gate opening operated from positioning cam. Weigh section again controls beam balance. Unbalance of the beam will actuate a clutch which re-positions the cam to raise or lower gate and vary feed to compensate for belt unbalance.

Still another uses a vibrating feed mechanism to supply material to a short moving belt. Weight on the belt is used to automatically adjust the feeder amplitude to maintain a constant load.

A fourth type utilizes the belt to pull material from the feed hopper. Balance position of belt itself serves to weigh the load and adjust a gate to retard or speed up hopper flow.

The second class of weigh feeder is one that weighs into hoppers. These units use belts, screws, and vibrators as the means of feeding. As the hopper nears its set weight, feeder mechanism slows until the last of the load is dribbled in. Then hopper discharges automatically and the cycle repeats. This feeder really belongs with the batch tank devices because of its start-stop characteristics. However, it may be applicable in certain types of continuous operations.

The loss-in-weight unit (Fig. 4) is really the last word in an automatic continuous solids feeder for extreme accuracy. Here, the hopper itself is scale-mounted and emptied by a mechanical vibrator, which is actuated by retraction of the scale poise at a preset rate, or in proportion to a primary flow. Any movement of the scale beam from the null balance position will vary the amplitude of the vibrator to bring the scale beam back into balance.

These feeders can be furnished in tandem so as to alternately operate as loss-in-weight and gain-in-weight, thereby maintaining a continuous feed. A bifurcated supply hopper is used to alternately feed each loss-in-weight hopper. When one feeder reaches a low weight position an automatic switchover to the second unit takes place. At the same time the first unit goes on refill and, as it fills, the poise is run out to a new balance position. Accuracies on this type of unit can be expected within plus-or-minus ½ percent.

Liquid Proportioning

Moving now to the continuous metering and feeding of liquids, we again find that they can be handled by weight or by volume. Probably the simplest unit for small quantity additions is the adjustable-stroke positive-displacement pump. Accuracies of plus-or-minus 1 percent can be expected, provided the meters are properly installed and maintained. Capacities can be furnished from a fraction of a cc. to 50 gpm.

Slip characteristics for these pumps are negligible. As the plunger is withdrawn, a metered volume of solution is pulled in through the suction line. When plunger motion is reversed, suction check closes and the volume thus trapped is forced through the discharge valve to point of application. Units have 10:1 capacity ranges, and changes are made either by adjustment of stroke length or stroking rate.

Another type operates on the same principle but uses a diaphragm rather than a plunger. Diaphragm completely seals the metering chamber, eliminating any packing requirements. In order to make the motor-operated units flow responsive, it is necessary to use a variable speed drive—either mechanical or electronic—or a control to automatically position stroke length. This is costly and complicates the system.

Fig. 5 shows a positive displacement plunger type easily adapted to automatic flow control. These pumps are operated hydraulically or pneumatically, and control of operating medium can be supplied from a displacement meter in the primary flow line. In the pumps themselves the impulse motor or drive end is directly connected to the reagent end. A mechanical meter in the primary line operates a pilot valve which, in reciprocating, admits the operating or power fluid to alternate sides of the impulse cylinder, thereby producing the suction and discharge operation. A typical schematic layout is given in Fig. 6.

These feeders have certain limitations. For one thing, no liquid containing entrained gas or air can be accurately measured by any kind of meter. Secondly, the positive displace-

ment pumps have reciprocating motion. They will deliver a pulsating flow unless equipped with hydraulic dampers. Then, there is a limit to both maximum and minimum stroking rates of these pumps. This will depend on viscosity as well as check valve efficiency.

Another liquid metering device, but not a feeder as in case of the pumps described above, is the volumetric displacement mechanical meter. The measuring element is usually a gear, piston, disk, vane, or turbine.

Use of these devices, is limited by such factors as "slip." This slip or leakage past the close-clearance-surface increases with pressure, thereby reducing volumetric efficiency.

Liquids by Weight

Loss-in-weight can also be applied to metering of liquid ingredients. Here the supply or storage tank is scale mounted. As in the case of this type solids feeder, the poise on the scale beam is retracted at a rate proportional to a primary impulse. Any departure from the null balance position will vary an air controller setting to operate a valve in the discharge line or control speed of a pump drawing from the tank.

Differential meters afford another means of measuring and controlling liquid flows. Most common among these is the orifice plate or Venturi type In this unit, measurement of the differential produced by a varying flow in the form of a time duration or air pressure signal can be transmitted electrically or pneumatically to perform the necessary control function. Another type finding wide usage is the variable orifice, fixed differential meter or rotameter. Here rate of flow is determined by height of the float above a zero reference point.

Industrial Uses

Now let us consider specific applications of these feeders to continuous processing. A rather simple instance is addition of vitamin C concentrate to juices, an operation similar to the one shown in Fig. 5. In this case a positive displacement meter measures fruit or vegetable juice flow. Meter rotation, representing flow, operates the pilot valve, which in turn actuates the metering device. The vitamin feeder is a pneumatically operated positive displacement pump. It requires juice flow to operate. And as a result, any fluctuations in flow will produce corresponding and matching fluctuations in vitamin feed. Both meter and pump are of sanitary construction designed for quick opening and ease of dismantling for cleaning.

Thickened and Flavored Continuously

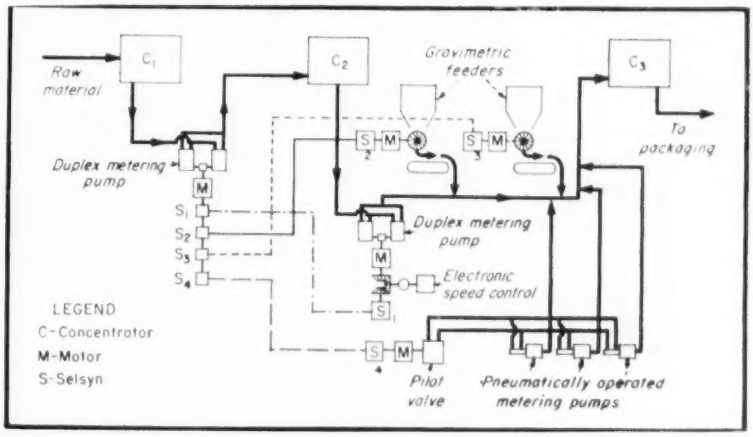


FIG. 7. Three-step continuous concentration process is controlled from first metering pump by four selsyn transmitters. Signal from first selsyn operates receiver at second metering pumps, second and third selsyns control dry feeders, fourth the two liquid flavor pumps.

Another continuous vitamin additive device is used in the production of spaghetti and macaroni. In this case the vitamin is added to a flour stream fed by means of a manually controlled gravimetric solids feeder. Vitamin addition is by means of a manually set volumetric disk feeder of the type shown in Fig. 1.

For Apple Sauce

Moving now to the more intricate metering and blending applications, there are any number that are alike in principle, differing only in the material handled. A typical application is the blending of apple sauce. Here a weigh belt mounted in series with a conveyor continuously weighs the apples as they move along the conveyor after having been peeled and cored. Weight of this material is transmitted as a pneumatic signal to secondary feeders that supply salt, water, and sugar.

The salt (made up as a solution) and water are fed by paddle-wheel type feeders. Speed of rotation is controlled through a variable speed transmission paced from the conveyor weigh belt signal. Sugar is fed by weight, and again the weigh signal paces the belt speed of the gravimetric feeder.

Multi-Product Blending

Now in use are a number of continuous operations that require sometimes as many as 100 or more different ingredients. Variations in material characteristics make it economical to go to the gravimetric type of feeder. One such instance is in formulated foods processing.

For making animal feeds, a gravimetric feeder is installed for each individual material. The particular formula is then set up on a main control panel into which are wired controls for each feeder. Operator selects the materials to be fed by a selector arrangement on the panel. This energizes certain feeders only. Rates for individual components can also be set.

Two methods are available for starting. In one, the feeds are sequenced so that the one farthest down the line will start first. When it reaches the point at which the next material is added, that feed starts, and so on down the line. This is accomplished by a timing operation. Another method is to start all feeders at once, but to run-off the first blend because it contains only partial proportions of those feeds nearest the blend point. This primary mix can be returned to one of the hoppers, since the magnitude is small and its effect will be negligible.

Prepared Mixes

Another application of this same form of equipment is in the manufacture of ready mixes for pancakes and gingerbread. Here individual gravimetric feeds are available for supplying any of 16 ingredients, and again the operator can select those components he requires for his particular blend. Once set up, these blends usually run for two or three days before any new formulation is made.

An added feature is provision for making two blends at once. Discharge of each gravimetric feeder is equipped with a swing gate. Feed can be diverted to one of two conveyors, thereby providing two blends at once—considering, of course, that no one ingredient will be required in both

blends at the same time. An individual panel is provided for each feeder. It is equipped with a handwheel to set required percentage of capacity and a recorder to provide a continuous chart record of material fed. Indicator lights show which panels are operating and whether they are on control. If any feed goes off control it will, after a time delay, stop all feeders until the trouble is remedied.

A cookie manufacturer uses a continuous process that feeds direct to baking ovens. A common jackshaft provides constant speed input to a gravimetric flour feeder, three volumetric disk feeders for cocoa, sugar and powdered milk, and a positive displacement metering pump for liquid ingredients.

An interesting application is found in the continuous production of another food product, where juice is drawn from a primary concentrator at a constant rate by a motor-operated two-cylinder positive displacement pump and fed to a second concentrator. Resulting concentrate is taken off by a second motor-operated duplex positive displacement pump and fed to another concentrator. This unit also receives three liquid ingredients from three other pneumatically operated metering pumps. Dry materials are fed from two gravimetric solids feeders (see Fig. 7).

From this final concentrator the blend goes to the mixing and packaging operation. Control for all this originates at the first metering pump. The motor drives not only the pump, but four selsyn transmitters as well. Signal from the first selsyn operates a receiver at the second metering pump. This drives one side of a differential, and motor input drives the other side. If the speeds do not match, a potentiometer signal to an electronic speed control unit is varied to bring the pump speed to selsyn input.

Second and third selsyn receivers operate variable speed transmissions on each of the gravimetric feeders. The fourth selsyn drives a motor-operated 4-way valve to control the stroking rates of the three pneumatic metering pumps.

As it is now operated, the first, or control, pump also has an electronic

(Turn to page 199)

'Air Envelope' Cars Will Compare Mechanical Reefers

FE STAFF

Two different systems of mechanical refrigeration are being employed in the series of 25 new "super-giant" reefer freight cars now being completed by Pacific Fruit Express Co. at its Roseville, Calif., shops. Thus the company will be able to make valuable comparisons of performance.

The cars themselves will enclose their loads in an "envelope" of cold air (FE Apr., p. 244). This is enabled by spacing plywood car-lining away from the walls. Accordingly, there is provided an air flue that communicates with similar air spaces over the metallic ceiling and under the floor.

First 14 of the cars are being supplied with Frigidaire diesel-electric cooling units that follow a design already in use on eastern lines. They consist of a 2-cylinder, 2-cycle, 34-hp. diesel engine direct-coupled to a 20-kw. 220v. alternator supplying electric power for two 5-hp. compressor motors and fans.

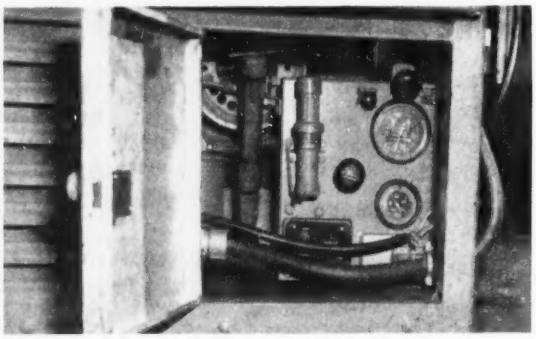
Compressors are of the 2-cylinder upright type running at 1,750 rpm. direct-driven. The cooling coil is compact—14 in. deep by 60 in. wide by 12 in. high—and is fitted into an opening in the engine compartment bulkhead. It employs ⅜-in. copper tubing and has ¼ in.-spaced fins.

Large Coils for Others

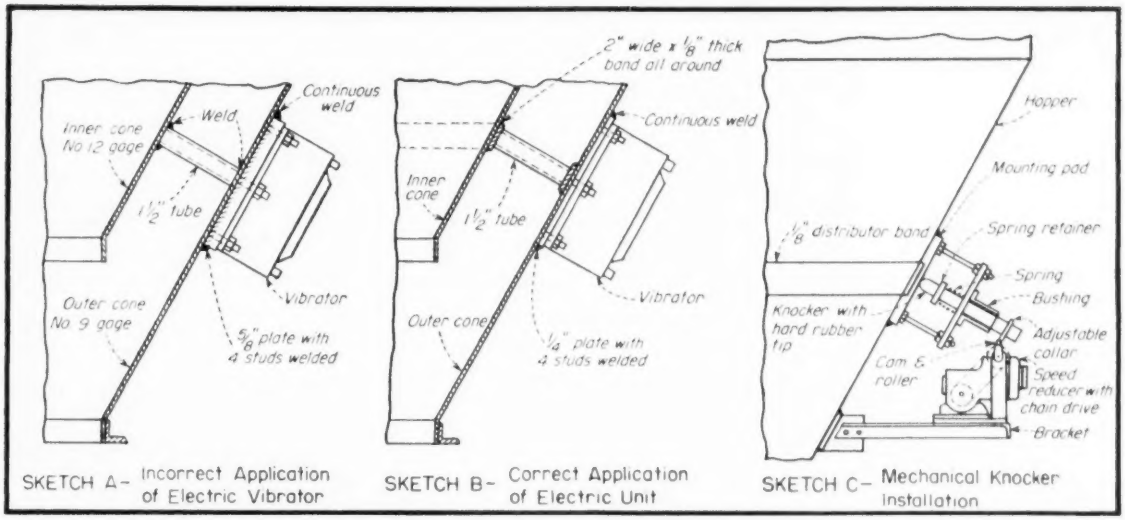
After careful analysis of the problems of mechanical refrigeration of railway freight equipment, involving numerous conferences with refrigeration engineers on the staffs of manufacturers, P.F.E.'s engineering personnel has further projected the trial of a large cooling or evaporating coil in the remaining 11 cars. However, in most other respects these cars will be identical with the first 14.

(Turn to page 198)

LOADS are specially enclosed in this new P.F.E. 'super-giant' car—one of 25 coming from its shops. Refrigeration unit is set behind louvered section (far end).



CONTROLS for Frigidaire unit employed in first 14 cars. Large dial (upper right): Tachometer showing speed of diesel motor operating compressors. Big knob at top of tach: Starts diesel. Small knob just to left: Stops it. Smaller dial under tach: Gives temp of motor. Black plate (lower left): Has lights to indicate high and low voltage (latter is norm). Vertical cylinder (left) is for starting engine in very cold weather. Ether capsule is dropped in, then replacement of top, which has inner sharp point, punctures capsule to spur start. Air heater knob (center) is then used. Cable (bottom) is for making connection to rail-side outlet to run compressors by electricity when car "stands by". Line just above aids in removal of unit for maintenance work. Slender pipe outside on right brings oil to diesel's crankcase.



Selecting and Installing *Vibrators*

Here's your "best bet" for top performance with these units that "keep the show going": First, precisely analyze the specific task. Second, choose the proper equipment. Third, engineer it to the job

FREDERICK MARICH
General Foods Corp., New York City

That time-honored tradition of the theater—that "the show must go on" despite whatever befalls—has a notable parallel in our own industry.

We refer to the food manufacturers' effective mandate that "production must not stop." And certainly the spirit is just as insistent here as on the stage—as is evident when you see plant workers pounding away at hoppers of spray dryers or at cyclones with sledge hammers, wrenches, or bars in order to clear clogs in the flow.

To get specific, however, much less forceful drama would be wise in relieving a hopper. Further, the "bang at it" method is but a temporary remedy that actually defeats itself by leading to extended periods of nonproduction, as well as entailing costly equipment replacements.

More effective, by far, is the mechanical vibrator. That is, provided the unit is properly selected and carefully installed to avert possibilities of fatigue cracks and resultant shutdowns while the hopper is replaced.

The accompanying charts, tabular material, and directions are intended to help engineers determine the most efficient type vibrators, size of units and cycles to choose, and number of units to install per hopper. Also pointed out are proper locations for applying vibrators to hoppers, and methods of attaching them for best results and least damage to the equipment.

Vibrators are of three kinds: The electric, the air operated, and the motor-driven mechanical hammer type.

Electric Vibrators

When a suitable electric unit is correctly incorporated, it will serve to uncork one of the worst bottlenecks in food plant operation. It can save plant management many a headache as well as many production dollars. However, when incompetently chosen or faultily attached, it can be as destructive as repeated blows of sledge hammers.

Since food products delivered from spray dryers and cyclones are light and air-swirled, outlet clogging would seem unlikely. Nevertheless, real difficulties are often encountered in moving such materials from these units.

When clogging is encountered, first impulse is to install a vibrator strong enough to shake the daylights out of the equipment—as "double insurance." Even so-called authorities have been known to encourage this practice by recommending vibrators with "20 percent extra power." But though on occasion this generalization may ring the bell, plant engineers soon learn that each vibrator application requires individual analysis.

By their very nature, vibrators introduce an obstruction to free-flow of materials. They create static electricity, negative-charging the hopper to attract positive-charge materials, and then tightly pack the material as it accumulates.

In addition, most food materials from spray dryers, and also many of those collected in cyclones, are hygroscopic. In steam-laden or moist atmosphere, accumulation and compacting of materials soon seals the bottleneck. In such cases the "20 percent extra power" aggravates rather than mitigates the condition. The result may be not only interrupted production, but also the opening of cracks in the hopper due to metal fatigue.

Grounding a cyclone or spray dryer hopper is a relatively simple task. Whenever an electric or air vibrator is used, the hopper should be grounded with thin copper strands

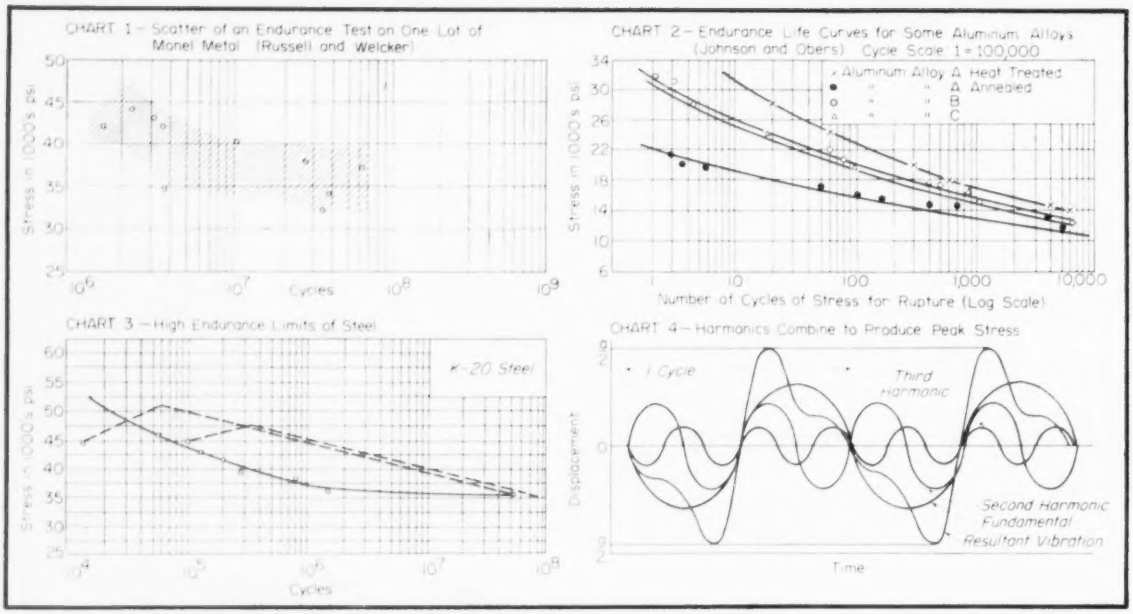


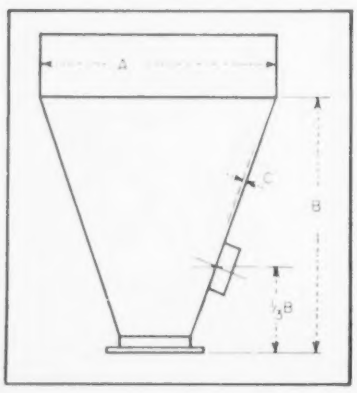
CHART 1 – Scatter of an Endurance Test on One Lot of Monel Metal (Russell and Welcker)
Stress in 1000's psi
Cycles
CHART 2 – Endurance Life Curves for Some Aluminum Alloys (Johnson and Obers) Cycle Scale 1 = 100,000
Aluminum Alloy A Heat Treated
A Annealed
B
C
Stress in 1000's psi
Number of Cycles of Stress for Rupture (Log Scale)
CHART 3 – High Endurance Limits of Steel
K-20 Steel
Stress in 1000's psi
Cycles
CHART 4 – Harmonics Combine to Produce Peak Stress
1 Cycle
Third Harmonic
Second Harmonic
Fundamental
Resultant Vibration
Displacement
Time

(soldered at intervals of no less than 3 ft. and run to the nearest girder). It is not sufficient that such hoppers are already grounded at their supports. Anyone with experience knows that static electricity is very fickle, that it must be grounded continuously as near its source as possible.

Fatigue in Metals

Now let us look at that fatigue problem. First of all, it must be said that calculating stresses in hoppers is a complicated and inexact process at best. However, with some experience along with data available in technical papers, it is possible to arrive at a general approximation of the correct application of vibrators to hoppers of cyclones, spray dryers, and similar equipment.

It should be noted here that such equipment is more or less "empty", as compared to storage bins, which normally are full. Therefore, there is no problem involved in "moving" the contents of the hoppers. The real difficulty is to prevent whatever contents there may be in such equipment from clinging to the hopper.



Here, it is desirable to provide a vibrator of maximum amplitude without overstressing the metal in the hopper. Ideal is a shock simulating the wallop that production men give to loosen material in hoppers not having vibrators.

To see how far it is advisable to go in this direction, let us look at some curves outlining the endurance moments of various types of metals.

Russell and Welcker, of the National Advisory Commission for Aeronautics, show a "scatter band" of an endurance test on one lot of Monel metal (see Chart 1). The band in endurance-limit points is due to inhomogeneities of surface flaws in specimens. The upper boundary represents what a material might do if flaws and inhomogeneities were avoided. The lower boundary represents what an actual piece of material containing such stress raisers would do.

Johnson and Oberg, in the *Proceedings of the American Society of Testing Materials* (Vol. 29, Part II, 1929) show an endurance life curve (Chart 2) for some aluminum alloys which have been employed in cyclones and hoppers. It is indicated by this curve that there is no definite stress below which it is known that an infinite number of stress cycles can be borne.

In other words, such material is certain to fail, regardless of what the stress may be, whenever sufficient number of stress cycles have been applied. This means that greater care must be exercised in applying vibrators to aluminum hoppers, and also that the number of cycles must be as limited as possible.

Vibrators on such hoppers should be utilized only when absolutely necessary. From this it is obvious that if the process demands continuous vibration to assure uninterrupted production, aluminum is not the proper material for such application.

Battelle Memorial Institute shows an S-N curve (Chart 3) for an unusually homogeneous steel specimen. The points for the higher stresses lie upon the curve much more regularly than is usual when so many points are determined. This indicates little scatter, as contrasted to the findings in Chart 1.

Also, in contrast to the behavior of aluminum, described above, this shows that the curve for steel changes direction. In short, there is a "knee" when the stress is slightly above, but

Data for Making the Selection

Hopper Size			Electric Vibrators		Air Vibrators		Mechanical Knockers	
A	B	C	Watts	Cycles Per Min.	CFM @ 80#	Cycles Per Min.	Hp.	Strokes Per Min.
3' 0"	2' 4"	1/16"	45	3,600	1.5	5,300	1/20	15–20
4' 0"	3' 0"	1/8"	75	3,600	2.0	4,900	1/12	15–30
5' 0"	3' 9"	3/16"	150	3,600	2.5	4,700	1/4	30–60
6' 0"	4' 9"	1/4"	275	3,600	3.0	4,000	1/4	30–60
7' 0"	5' 4"	3/8"	600	3,600	3.5	3,600	1/3	30–60
8' 0"	6' 3"	1/2"	1,000	3,600	4.0	3,600	1/3	30–60

closely approaching, that for the endurance limit. Around the knee of the curve a small decrease in stress results in a very large increase in life.

The dotted lines indicate retests of two specimens that originally remained unbroken after 50,000,000 cycles. One of these was damaged when retested at the 50,000,000 cycles—*i. e.*, it broke at a smaller number of cycles than did a virgin specimen. The other was not damaged—it broke at a larger number of cycles than a virgin specimen.

This shows that steel has a definite endurance limit as compared to aluminum and most other non-ferrous metals. It also indicates that if certain endurance limits are not exceeded the material will never fail, regardless of the number of cycles applied. On the other hand, it predicts that the material will fail in a definite number of cycles when this endurance limit is exceeded.

In the food industry, stainless steel is widely used for hoppers in cyclones and spray dryers. And there are certain to be many surface flaws and inhomogeneities in the material—particularly around welded seams and ground joints. Therefore, it is advisable to exercise care in applying powerful vibrators, even though such material is in other ways admirably suited for the gruelling punishment of vibrators.

Peak Stress From Harmonics

H. H. Bruderlin has pointed out (*Aviation*, Jan. 1940) how harmonics combine to produce peak stresses (Chart 4). This is another point to remember in applying vibrators to hoppers. Several harmonics may be caused by one or more vibrators applied to the same hopper. Experience in such matters indicates that vibrators of proper size and selection should be placed a minimum of 6 to 10 ft. apart on the circumference, depending on the thickness of the metal and the power of the vibrator. Also they should be staggered in the vertical direction—for best distribution of the vibration.

In big diameter spray dryers, it is advisable to have a large number of smaller size vibrators distributed in a staggered fashion around the circumference. Also, more vibrator mountings should be provided than vibrators, so the locations can be changed as operating conditions may dictate.

As implied earlier, it is generally a good policy to avoid using oversize vibrators. Common temptation is to try to hit many birds with one stone, but large vibrators cause excessive local stresses without causing sufficient vibration at a distance of 6 to 10 ft. In addition, the static electricity caused by these oversized electric vibrators further aggravates the situation, until the effect of the vibrating unit is practically nullified.

Electric vibrators can, however, be successfully applied to a variety of situations. Since a large number of sizes of commercial vibrators are available, plant engineers or designers have considerable flexibility in making a proper selection.

In use, the vibrators are highly efficient, consume relatively little power, and the amplitude of the vibration can be varied to suit different operating conditions. Another asset is that they are quiet in operation and, therefore, do not present any nuisance in the plant.

One characteristic of these vibrators that may be considered adverse is the high frequency. On a 60-cycle current, operation is at either 3,600 or 7,200 cycles per minute. This means that the designer must exercise particular caution to avoid development of fatigue cracks, as described earlier. However, once a proper design is executed there should be nothing to fear on this score, particularly if the hopper is of steel.

A hypothetical case of incorrect application is shown in Sketch A. Here, both inner cone and outer skirt are being vibrated by an oversize electric unit. The 1½-in. tube welded to the inner cone appears r'arin' to poke a hole in the relatively thin inner cone. The heavy $\frac{5}{8}$-in. mounting plate on the outer skirt is also quite likely to develop excessive strain due to its being welded to the relatively light outer skirt.

A situation like this can be corrected—as is shown in Sketch B. Here, the inner cone is reinforced by a vibration-distribution band, tack-welded to the inner cone. In similar fashion, the outer skirt is also reinforced by a distributor band. Instead of a $\frac{5}{8}$ in. mounting plate, one of $\frac{1}{4}$ in. is sufficient.

Further, improvement can be obtained by substituting for one large vibrator two small units spaced 8 to 10 ft. apart. Again, it should be remembered that adequate provisions must be made to ground static electricity in every vibrator installation.

Air Vibrators

On installations such as we are considering here, air vibrators are sometimes used. However, they are not best suited for the continuous operations required on cyclones or spray dryers. Air vibrators can be operated at high frequency almost the same as electric vibrators. However, their amplitudes cannot be as readily adjusted without greatly reducing effectiveness.

Air vibrators are of low efficiency, due to the conversions—electric energy to compressed air energy to mechanical energy. The electric vibrator, on the other hand, converts electric energy directly to mechanical energy. Lastly, air vibrators are noisy.

For these reasons, they are recommended only for intermittent service where they will be used but a few times a day. For such installations, the low first cost of air vibrators can be very attractive.

Hammer Type

There are other instances where neither electric nor air vibrators will do the job properly. These situations call for a mechanical knocker, custom designed to suit the particular requirements (see Sketch C). This type unit employs a speed reducer with chain drive, cam, and roller actuating a spring-returned piston with a hard rubber tip. Objective is to produce a relatively hard kick at low frequency to simulate the heavy blows such as delivered by men using sledge hammer or wrench.

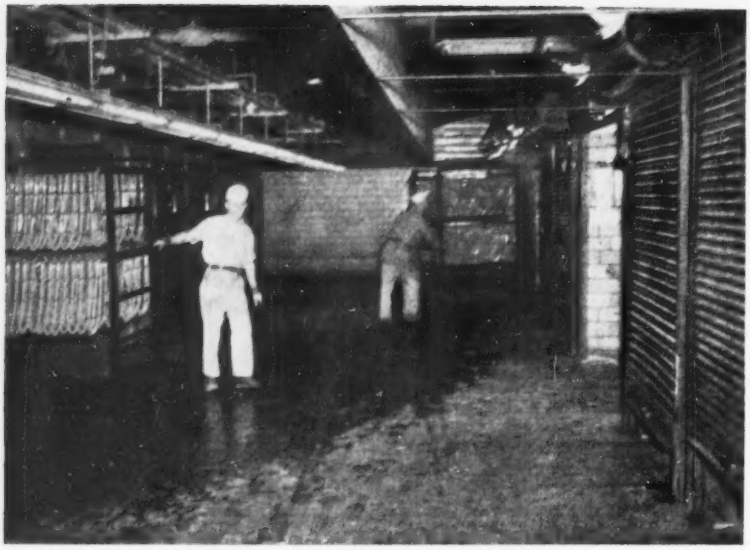
On installations like this, size of the spring and motor can be varied to produce exactly the required force and frequency necessary. This flexibility is practically unlimited, particularly as compared to electric and air vibrators. However, the first cost and maintenance of such mechanical knockers will be relatively higher. This relegates their use to special applications where their employment may be vital in a plant's production scheme.

Guidance Sketch and Table

Suggestions for choosing various sized electric, air, and mechanical vibrators to be used for different sized bins are shown in our panel "Data for Making Your Selection." For the first two types, sizes are approximate equivalents of what various manufacturers would recommend.

The mechanical knockers are covered here as approximate equivalents for the special situations that may justify their use.

As has been emphasized, each vibrator installation must be tailored. Hence, we hasten to point out that the figures shown here are merely intended to give perspective to the engineer, who should analyze each of his applications separately. In short, none of these data should be taken as literal recommendations for specific installations, nor would any vibrator maker offer any such blanket recommendations, since there are far too many unpredictable variables to be considered.



SEPARATING the cookers (left) and smokehouses (right) has permitted individual improvements and closer control of each operation.

Separate units engineered to do their special jobs under the direction of precise controls yield top-quality sausage

CHESTER W. SCHMIDT
Chief Engineer, Peter Eckrich & Sons, Inc., Fort Wayne, Ind

Divorces Smoke From Cook

Quality of sausage is judged by the direct effects of smoke and heat processing—its inner and outer color, physical condition, and flavor. And today's trend to faster, more complicated, multi-purpose smoking schedules has made the processing factors involved that much more critical.

In our operations at Peter Eckrich & Sons, we believe we have taken a somewhat unique approach to this problem. We manufacture a traditionally heavy-smoked product and have not found the multi-purpose unit equal to this primary need. Hence we have bucked the trend and separated the functions of smoking and cooking.

► **However, by concentrating on perfection of both the instrumentation and basic engineering design of each of these two operations, we believe that our sausage today displays more consistent high quality than ever.**

Let us first consider improvements in our smoking pits, which are doing much to eliminate the criticism this operation commonly receives.

Many of these smoking pits have been built in the past few years and are based on ever-improving company-developed designs. To carry on this program, a test house has been set up, at the Kalamazoo, Mich., plant, having complete instrumentation for pilot studies. Here we try out and prove new equipment and designs that are later applied to all houses.

Our primary studies on the pilot house were aimed at better fuel utilization and heat-transfer. We wanted to be able to load our houses with more product and move it through at a faster rate—yet also be very sure of our traditional heavy smoke and consistently high quality.

Burners Improved

First change to be made was in the gas burner system itself. Conventional inspirator type systems were replaced with Maxon Premix units. This permitted changing our ribbon burners to pressure type units that jet out a high, hard flame. Because of more complete combustion, the new system results in a cleaner product with less soot deposit. Also, the burner assembly itself cleans easier and less frequently than the ribbon arrangement.

A feature of the Premix burner system is that its air blower runs constantly—only the gas is turned on and off in controlled firing. This tends to keep the burner clean and assure air at all times.

More efficient combustion in the new burner system has also resulted in better temperature control. Tests in the pilot house indicate that a vane-type thermometric electronic contact-controller is able to hold house temperature to within a few degrees F. with on-off control. Experiments are also under way to determine if a gas throttling control would be even more satisfactory.

Another improvement in combustion systems was installation of the Brown Protectoglo on all burners. This device detects the loss of pilot flame, signals this, and automatically shuts off the main gas valve. A manual re-set is then necessary to relight the burner—hence the hazard of stray gas build-up is eliminated.

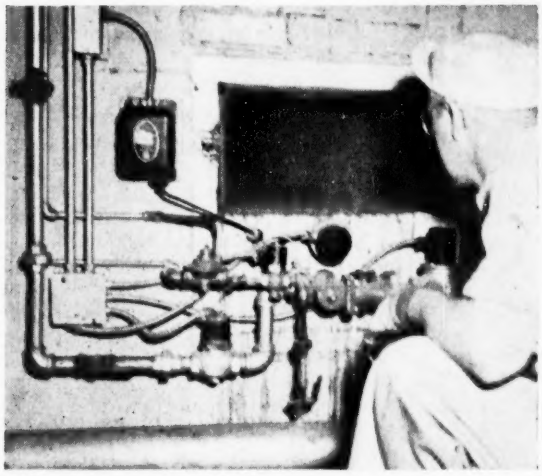
A constant trouble in our smoke pits was the warping and bending of the steel plate that holds the sawdust above the burner flames. Apparently, the cold sawdust above and hot flame below led to this condition through differential temperatures. A foam-type insulation plate made of Pli-Cast 27 and formed in our own shop has now replaced these steel plates. It performs very satisfactorily.

Draft Important

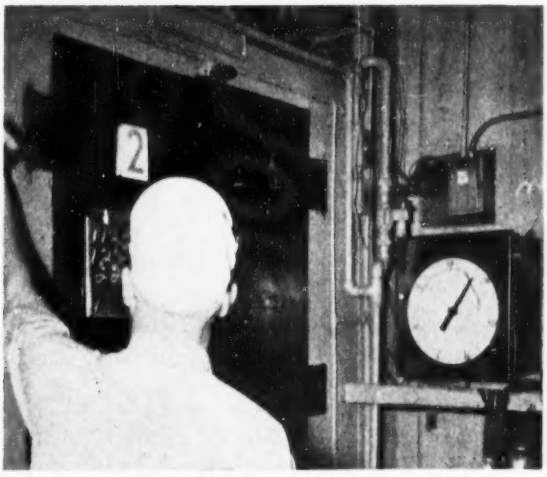
During routine recordings of temperature distribution, smoke density, product temperature, and draft in the test house, the importance of proper air circulation was brought into bold relief. For while efficient burners and better temperature control showed up in heavier smoke and more uniform product, it was apparent that slight changes in the draft had a profound influence on the *speed* as well as degree of smoke penetration.

In general, the more rapidly the

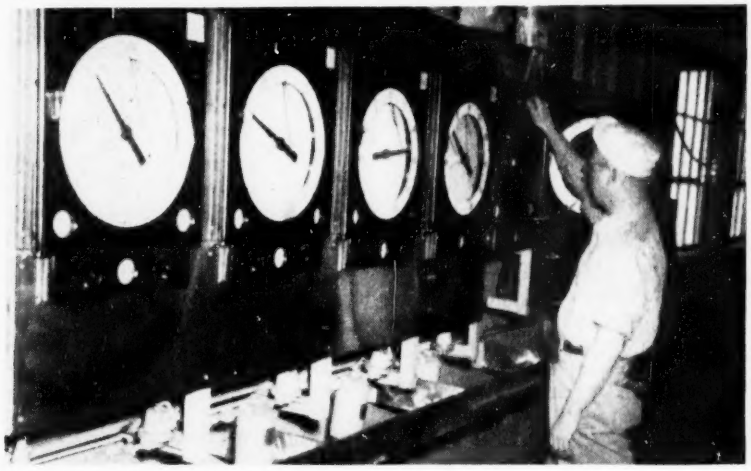
Engineering Better Sausage Operations



EFFICIENCY of combustion has been upped by new Premix type controlled burners.



TEMPERATURE of product is probed by 'couple, and instrument reveals vital smoking data.



ELECTRONIC controllers regulate all cooking operations. Adjusting knob permits fast and accurate change of cooking schedule.

THERMOCOUPLE, in stainless well, extends halfway down cooker side.

mixture of smoke and air moves over the meat the more rapid the smoke penetration. However, after an initial period of quick smoke penetration it is desirable to reduce the movement and discharge of air through the house so that humidity will build up and shrinkage be minimized.

As set up, our pit houses are single story 8 x 12 ft. areas, each leading to its own chimney stack. Only control of draft, therefore, is through a manual setting of the air inlet damper to the house.

Current studies are directed toward providing a more controllable draft so that attendants will be able to critically "trim" this factor during operations, when necessary.

Other important factors in smokehouse operation, such as insulation, layout, and materials, are being studied for further improvement. One such vital project is a means for continuous, direct measurement of smoke density and its ultimate use as a master control of the burner system.

Critical Cooking

Separating the smoking function from cooking and washing served one very handy purpose—it isolated the much maligned smoke treatment so that product variations due to smoking alone could be quickly spotted and corrected.

Actually, however, much of the trouble laid to the door of smoking took place later in the cook, which is a much more critical operation from the temperature standpoint. Hence, an equal amount of engineering time was devoted to improving the cooking procedure and its controls.

Our previous isolated equipment for cooking had been vapor-type units where steam coils submerged in water produced vapor that rose up over the product. Close temperature control here was well-nigh impossible.

Our cookers today are of the roll-in cabinet type employing live steam for heating and are completely company designed. We employ 15-lb. saturated steam supplied from overhead piping to spreader pipes. Another system is used for spraying water during the subsequent washing period.

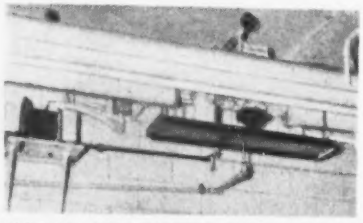
Since we consider finishing in the cooker to be the most critical operation in sausage processing, we have concentrated on installing the most precise temperature control possible and have adapted our cooker design to accommodate this control.

Each cooker is equipped with a Brown ElectroniK throttler type air

Electronic "Eye" Looks 16 Ways

MASTER CHECK of 16 important temperatures throughout plant is provided by this fast electronic strip-chart recorder.

Better Environ



MOTOR-OPERATED back-pressure valve holds air temperature in the critical areas.

HUMIDISTAT controls jetting of steam to air in the packaging and holding rooms.

controller, range 0-200 deg. F., which operates a diaphragm-type valve in the steam supply line. The sensing element—special stainless-steel enclosed thermocouple—is suspended along one side of the cooker at about mid-height. With this combination we are able to secure consistent ± 1 deg. F. control.

Settling on the right thermocouple design was a problem. The alternate steam and cold water provided a constant thermal shock and grounded out the 'couple through its corroded joints. A fused-glass seal joining the 'couple with its present stainless steel well has solved this problem.

Additional flexibility has been provided in the electronic instruments. A manual-bypass below the case permits switching to hand control of the steam valve when the instrument is being serviced or during startup, if desired.

As we improve our cooking process through faster and more precise instrumentation, we have been rewarded by new standards in consistent and highly accurate temperature control.

Also, we are experimenting with scheduled cooking and find that simple adjustment of the external control setting knob on the instruments permits very rapid and precise "programmed" temperature. When this technique is fully worked out, we expect to cut metal cams to simulate the schedule for various products and thus automatically drive the control point settings of our instruments.

Two electronic check instruments are in constant use surveying the precision of our smoking and cooking operations as well as temperatures in other process equipment and critical room areas.

Master Checking

The master instrument is a 16-record strip-chart Brown ElectroniK which is mounted on the refrigeration control panel in the engine room. This reaches various locations through conduit-carried thermocouple lead-wire and provides continuous time and temperature records of coolers and freezer, of the boning, packaging, chilling and curing areas, and of product and casing storage. Also, thermocouple plug-in junctions are spotted throughout the plant to permit use of the recorder for in-product temperature studies, as well as other air and equipment measurements as may be required.

A second electronic test recorder—of circular-chart type—is wall-mounted next to the cooking ovens. Meat-sticking needle-like thermocouples are connected through a plug arrangement to this unit, and charts can thus be drawn on in-product temperature during such operations as smoking, cooking, and baking. This permits formulation of exact process schedules and cutting of circular chart cams for eventual automatic programming.

Atmospheric Control

In addition to close process control, we have carried out a program of precise atmospheric control in process, packaging, and storage areas to minimize or eliminate product deterioration during exposure and holding.

We employ thermostatically actuated, electrically driven Hubbell back-pressure regulating valves on the refrigerant lines leading to unit coolers in critical areas. In the packaging room, for example, this control is held within 1 deg. F.

In less critical areas, the back-pressure valve on the refrigerant line is hand-set to maintain a constant value.

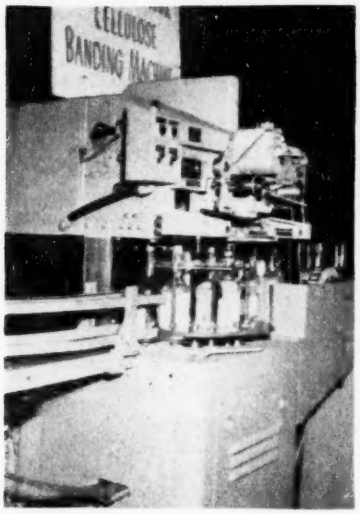
In critical humidity areas, such as the finished product cooler and packaging materials storage, Armstrong units inject steam into the air on the demand of closely set humidistat instruments.

Because of our multiple-shift operation, the continuous master recording of the above areas and processes has been a vital production control tool. And at the end of each 24-hr. run, all chart records of operations are delivered to the superintendent's office for careful study and filing.

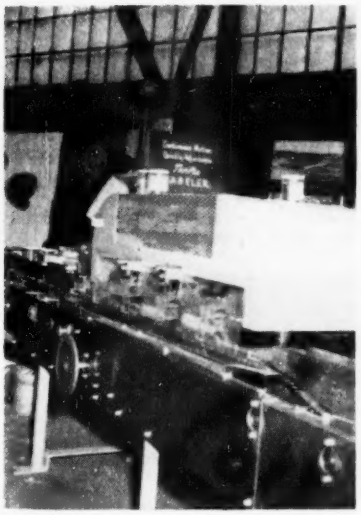
FOR FASTER PACKAGING

Unveiled at Packaging Exposition in Chicago were many advanced machines for bottling, canning, bagging, cartoning and wrapping lines

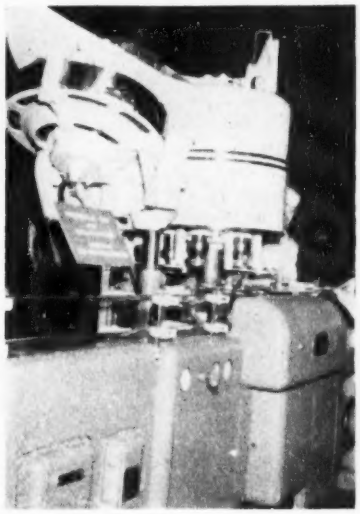
Latest Equipment for Bottling Lines



BANDER (65 per min.) takes cellulose from roll, positions it over bottle, cuts to length. Ease of maintenance featured.—Economic Machinery Co., Worcester, Mass. (83A)

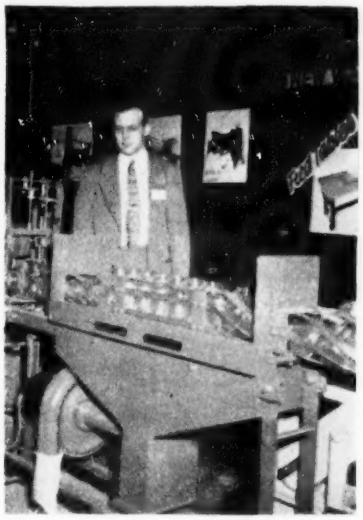


CONTINUOUS-motion labeler does 120 per min. Labels 4-oz. to 1-gal. bottles. Size change made in minutes by simple adjustments.—Package Machinery Co., Springfield, Mass. (83B)

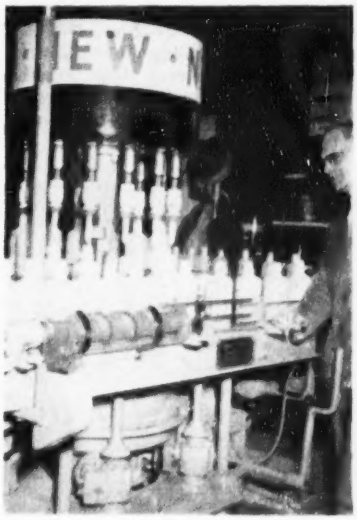


6-HEAD capper does 200 per min. Featured is "no bottle, no cap" safety, air-operated chucks, helical feed, and safety devices. — Pneumatic Scale Corp., Quincy, Mass. (83C)

UNSCRAMBLER handles 500 containers per min. with 1 or 2 men. Walkie-Pushie designed unit matches speeds of high-capacity lines.—Island Equipment Corp., Long Island City. (83D)



LINE for cleaning 160 jars per min. Jars are inverted into cleaning section for water, steam, or air cleaning, then twisted upright. — Chisholm-Ryder, Hanover, Pa. (83E)

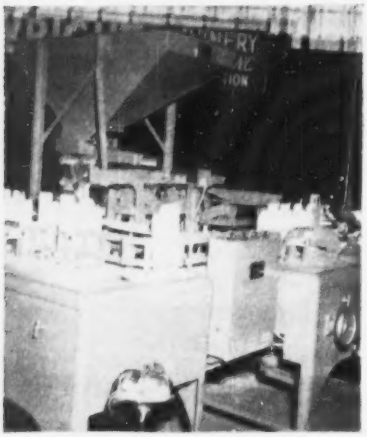


ROTARY filler features plastic sleeve valves, conveyor, feed line, and liquid-level float. Supply tank is plastic-coated steel.—Horix Mfg. Co., Pittsburgh, Pa. (83F)

Want more information about any items in this picture article? Just circle key number (in parentheses at end of each caption) on the Reader Service coupon page 159.

Turn Page for More New Units→

Carton Machines; Case Coder and Sealer



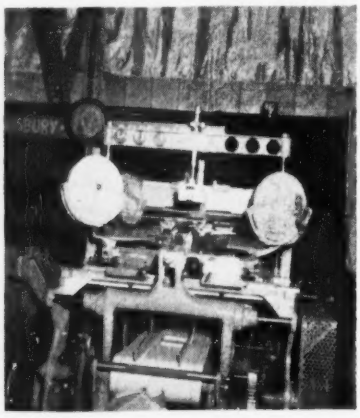
CARTONING unit fills, weighs, closes 30 cartons per min. Handles free-flowing items in 4-16 oz. units. Has a two-station weighing unit.—Wright Machinery Co., Durham, N. C. (84A)

AUTOMATIC box former takes corrugated stock and box board. Speed is 20 to 60 per min. Forms blanks up to 24x26 in. — Manufacturer: Kliklok Corp., New York. (84B)

BUNDLER has attachment to print roll-fed paper in widths from 4 to 10 in. Adjustable machine bundles at speeds of 20 to 25 per min.—Scandia, N. Arlington, N. J. (84C)

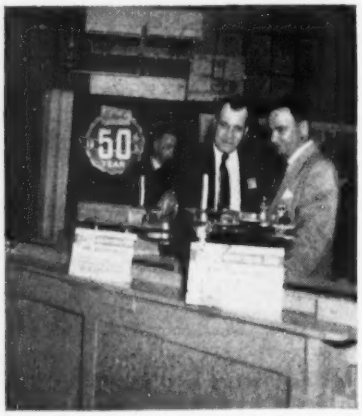
MACHINE for forming and lining 120 cartons a minute was demonstrated by Peters Machinery Co., Chicago. Lined cartons are used for lard and shortening. (84D)

LATEST carton-closing machine was shown by Machinery Mfg. Co., Los Angeles. New, straight-through unit is flexible, can be installed on any production line. (84E)



IMPROVED carton stayer is completely automatic from feeding of blank to stayed carton. Speed is 110 per min.—Kingsbury & Davis Machine Co., Contoocook, N. H. (84F)

FORMER sets up and glues 60 single and double end-wall cartons per min. Pre-set counter stops machine at desired amount.—Meyer-Clement, Sterling, Ill. (84G)

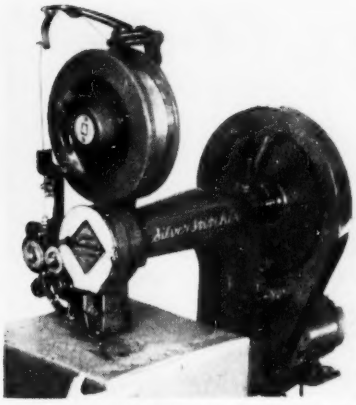


LATEST coder imprints side and rear panel of shipping case without turning it. Unit can be mounted in case sealer or conveyor.—A. Gottscho, Inc., Hillside, N. J. (84H)

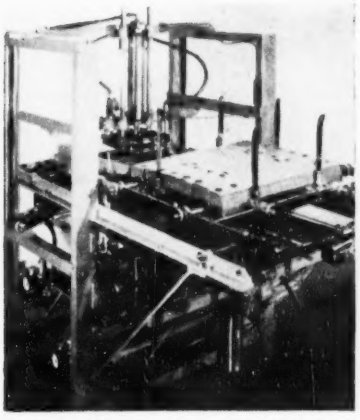
SHORT case sealer spot-applies glue for economy and fast drying. Occupies only 30 sq. ft. Seals 4 to 8 cases per min.—J. L. Ferguson Co., Joliet, Ill. (84I)

Newest Case Formers

600 PER HOUR is speed of new unit that imprints, slots, and scores carton blanks, for folding, taping, or stitching.—Colt's Mfg. Co., Hartford, Conn. (85A)



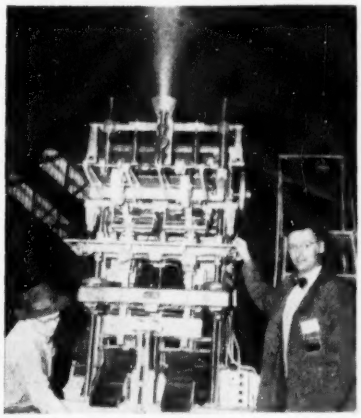
NEW "ARCUATE" wire stitching is stronger, lighter, and resistant to buckling. Speeds carton sealing; lowers wire costs.—Acme Steel Co., Chicago. (85B)



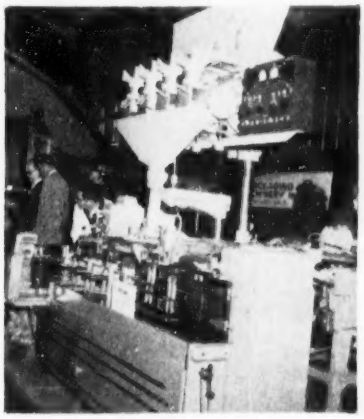
BOX-FORMER, pneumatically-activated, handles Higgins-style, tray-type carton. Speed is 6-7 per min. Hopper feed holds 100 blanks.—Gaylord Container Corp., St. Louis. (85C)

Advance Bag Formers and Fillers

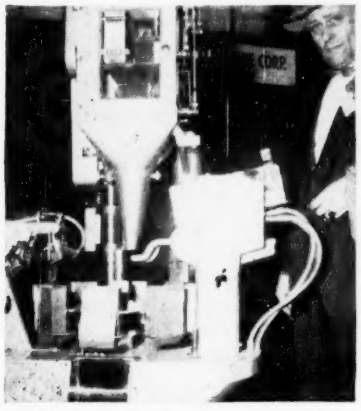
100 PER MIN. is speed of packet former-filler shown by Brown Bag Filling Co., Fitchburg, Mass. Forms packets from roll and fills with free-flowing product. (85D)



PACKAGING of oils and other liquids is 120-a-min. job of this unit. Operation, from roll to finished package is automatic.—Stokes & Smith Co., Philadelphia. (85E)

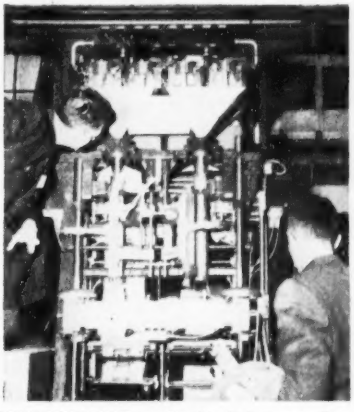


MULTI-UNIT makes bags, weighs, fills, seals, and check-weighs at 30 per min. Checker indicates adjustment needs.—Simplex Packaging Machinery Co., Oakland, Calif. (85F)



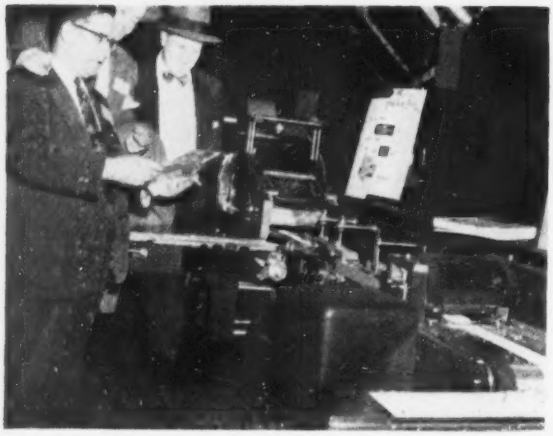
BAG FILLER-SEALER supplied with net weigher, volumetric or auger filler. Speed: 20 to 40. Unit handles heat-sealable bags. — Clybourn Machine Corp., Chicago. (85G)

4,000 AN HOUR is speed of new bag former that features electric braking and unwinding, static eliminator, staker, and jam-proof feed.—Hilker Products, New York. (85H)

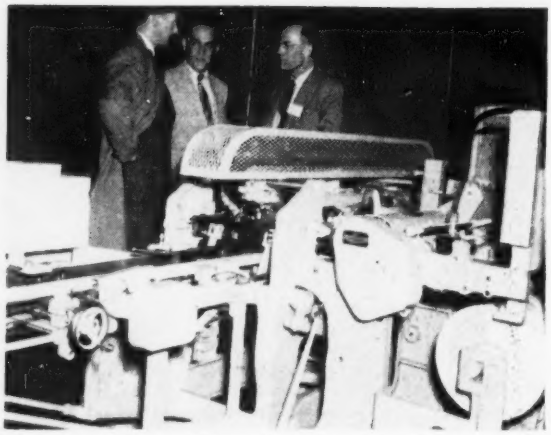


NET-WEIGHT scale feed is new feature on machine shown by Transparent-Wrap Machine Corp., Hasbrook Hts., N. J. Accurately weighed items are filled into formed bags. (85I)

Speedy Wrapping Machines

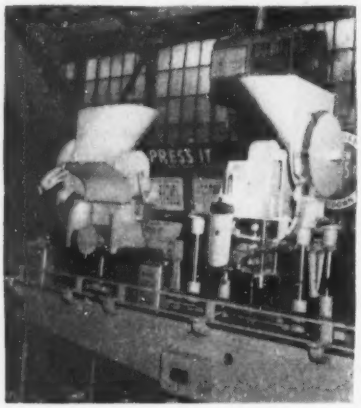


CONTINUOUS unit cuts and scores boats from paperboard roll. Small pies are fed into boats and overwrapped. Rate: 70/min.—Hudson-Sharp Mach. Co., Green Bay, Wis. (86A)

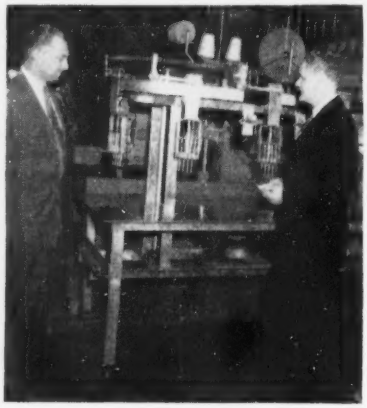


WRAPPER delivers 160 packages per min. Operating without cams, it makes tight, recessed end-fold.—Battle Creek Bread Wrapping Machine Co., Battle Creek, Mich. (86B)

15 Other Units and Devices



COMBINATION capper and bander handles containers from pints to 2 gal. at speeds of 30 to 60 per min. Employs scored, tamper-proof bands.—U-Pressit Co., New York. (86C)



ROBOT SIZER unit assures accurate weights within ½-oz. Scales adjustable for weight up to 7 lb. Unit can be used for whole and cut-up poultry.—W. F. Altenpohl, Inc., Philadelphia. (86D)

SHAFT inserted in paper-roll core expanded by compressed air, collapsed by release valve. Saves time, cores, and paper.—Paper Converting Machine Co., Green Bay, Wis. (86E)

NEW flexible, variable-speed drive displayed by Reeves Pulley Co., Columbus, Ind., features mounting flexibility and wide speed range. New plastic unit also shown. (86F)

ELEVATOR has non-dump, hinged-bottom buckets for lifting material in metered flow from floor-level hopper to any distance above floor.—U. S. Engineering Co., Long Island City. (86G)

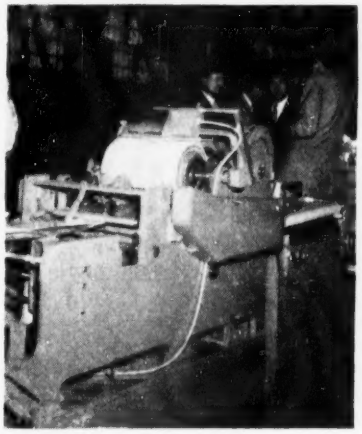
LABEL dispenser requires one manual stroke—separates label from stack and simultaneously moistens.—Dispens-A-Label Devices, Pittsburgh, Pa., is the maker. (86H)

SHEET COUNTER requires zip of probe down edge of fanned-stack sheets. Count of several thousand sheets per second is totaled.—Unitronics, Inc., St. Louis. (87A)

CHECK-WEIGHER has plug-in unit with three electron and phototubes and controlled-motion scale beam. Speed: 100 per min.—Illumi-Tronic Eng. Co., Sunnyvale, Calif. (87B)

CAN EJECTOR comprises photoelectric eye to detect poor labeling. Improperly labeled cans rejected.—Illumi-Tronic Eng. Co., Sunnyvale, Calif. (87C)

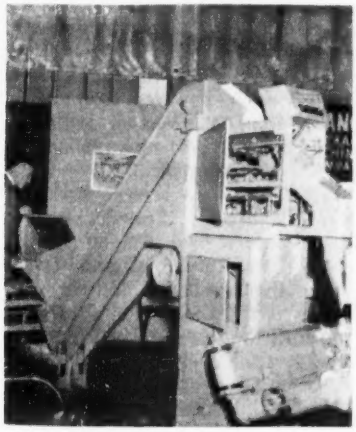
HIGH-SPEED electric brakes and clutches designed for packaging machines by Warner Electric Brake & Clutch Co., Beloit, Wis. Controls expected to double output. (87D)



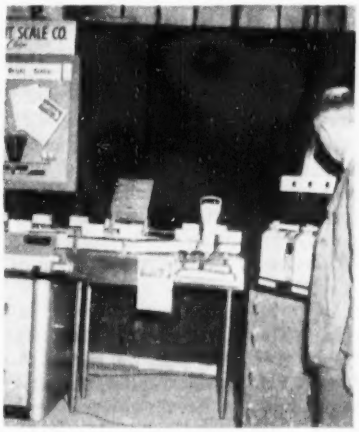
GIANT polyethylene bags are made from flat or gussetted tubing at rate of 20-60 per min. by unit with automatic stacker.—Roto Bag Machine Corp., New York. (87E)

CAMBERING ROLLER method of accurately positioning a moving web of any type of material was demonstrated by Automatic Web Control Mfg. Co., Oklahoma City. (87F)

THIS electronic counter features longer life, cold cathode tube. Counts carton blanks, cans, and bottles at 2,000-per-sec. speeds.—Post Machinery Co., Beverly, Mass. (87G)



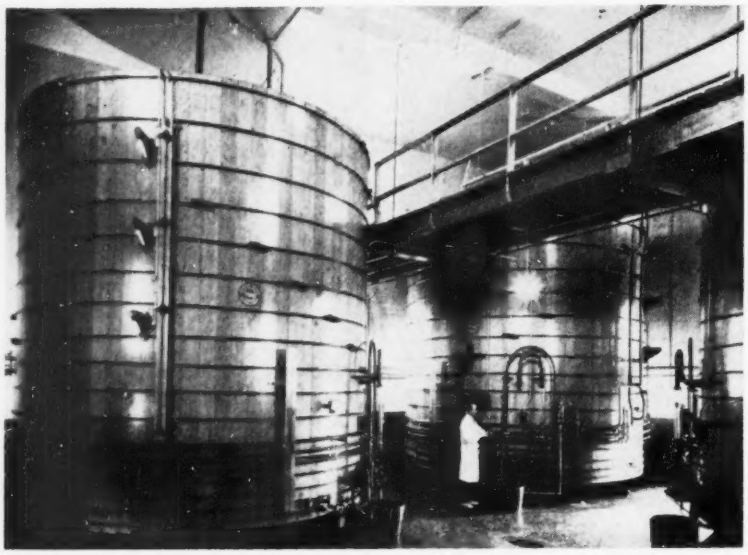
WEIGHER has rear-feed for delivering fragile items to scales. Belt is actuated by plate hooked up to mercury switch. —Triangle Package Machinery Co., Chicago. (87H)



ELECTRONIC check-weigher for detecting and rejecting underweights demonstrated with chart (right) to show weight variations.—Exact Weight Scale Co., Columbus, O. (87I)

Compact plant . . .

Three "giant" robot-controlled generators turn out 6,000 gal. of vinegar daily under optimum conditions in new Midwestern plant. Superseding 310 small generators, they have increased yield and minimized supervision



HUGE generators are housed in special building that is air-conditioned and totally enclosed to prevent contamination of acetic acid bacteria. Three units can produce more than 20,000 gal. of vinegar in about a week's time.

VINEGAR IN VOLUME

LLOYD E. SLATER
Associate Editor, "Food Engineering"

Bacteria may well be considered as "tiny plant personnel" who respond with maximum effort to good working environment and intelligent direction.

Food manufacturers who rely on such diminutive workers in their processes started "bacteria benefits" ages before safety shoes and overhead lighting. Yet it is only in very recent years that optimum working conditions have really been established for useful microflora.

A late advance in vinegar technology is a case in point. Acetic acid bacteria have been treated considerably since antiquity—a fair temperature and a modicum of oxygen being their recognized prerogative. But it took the modern closed-system vinegar generator, with its engineered, automatically controlled environment, to really bring out the heroic productive potential of *A. aceti*.

A glowing example of zealous bacterial productivity is the spanking new vinegar generating plant of the M. A. Gedney Co. in Minneapolis, where in immense units the age-old process is improved by instrument control. Here, three huge robot-directed Frings generators turn out 6,000 gal. a day—providing more and better acetification than the previous 310 smaller generators. Further, these optimized bacterial "work shops" bring added benefits by—

- **securing more efficient and complete conversion of mash to vinegar.**
- **greatly simplifying attendant quality control and sanitation routine.**
- **reducing the complete acetification operation to one-man supervision.**

A quick run-down of the general vinegar process will serve to bring the new Gedney generating facility into sharper perspective:

Two types of vinegar are made by the company—corn sugar (dextrose) and white distilled. Corn sugar vinegar is made up as a mash in remote fermenting vats prior to acetification. White vinegar, however, is processed directly from tank cars of 188-proof alcohol discharged to a premix tank in the new generating plant.

In readying a corn sugar mash, 80 sacks (100 lb. each) of dry dextrose are charged into a 5,000-gal. fermenting tank. Water, nutrient salts, and liquid brewers yeast are added, and the wort is allowed to ferment for about ten days until the dextrose has been converted to alcohol. This makes a 4,000-gal. batch.

Next, the fermented mash is pumped through a filtering process for effective removal of the yeast. The product is then held in a supply tank until its pipe delivery to the new building to charge a generator.

After the alcohol mash is converted to vinegar (to be described in detail shortly), it is pumped into wood storage tanks for aging. Then it is filtered through a Sparkler unit and pasteurized by a tubular heater at 155 deg. F. The finished vinegar is packaged in glass or barrels.

Filtered Air

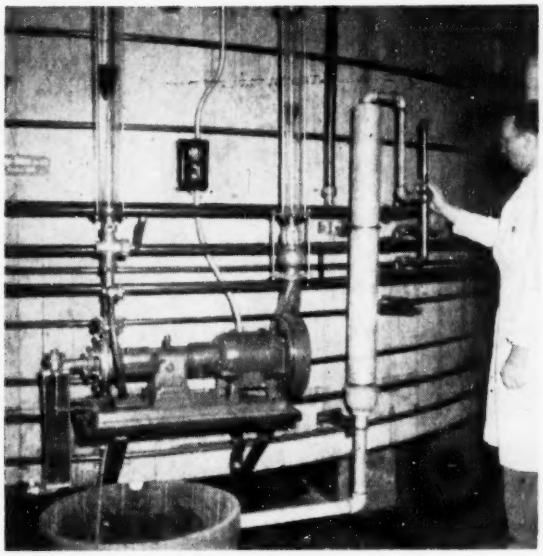
Completely isolated, the generator building is a modern concrete and glass structure about 40 ft. tall and 50 ft. square. It has no windows and secures fresh air through a filter and forced-circulation system. This provides the ultimate in sanitation.

Only four vessels are contained in the one-room building. Three of these are the circular hardwood, steel-rib reinforced "giant" generators standing 18 ft. high and bulking 17.5 ft. in diameter. The fourth is a smaller tank for premixing and diluting a mash charge and for making up alcohol-low wine.

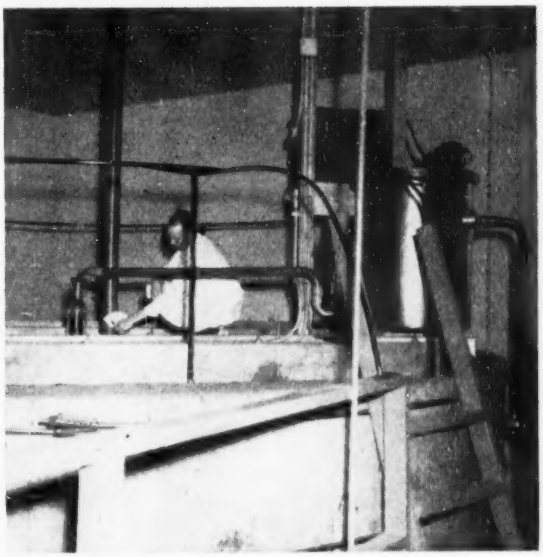
An elevated companionway serves the tops of the generators, where vital control components are located.

Mash and utilities are delivered by underground pipe to the building. These include product delivery and return lines, artesian well cooling water, steam, and a condensate return. These pipes route in from a supply

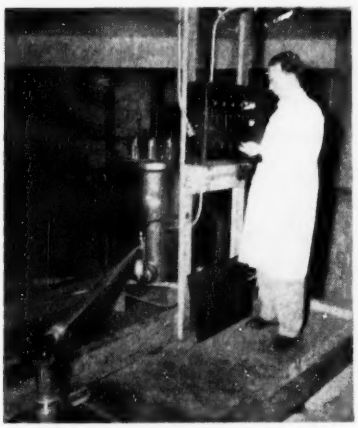
. . . and its automatic actuators



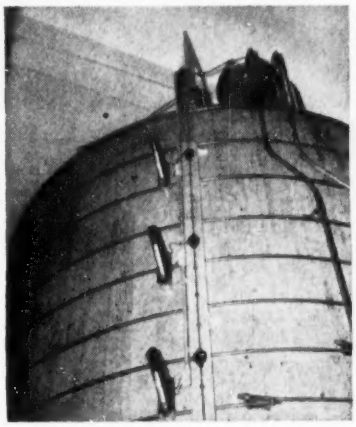
EACH unit has concentric tube heat-exchanger for automatic cooling of recirculating infusion. Rotameters (glass tubes) gage air flow and recirculation rate.



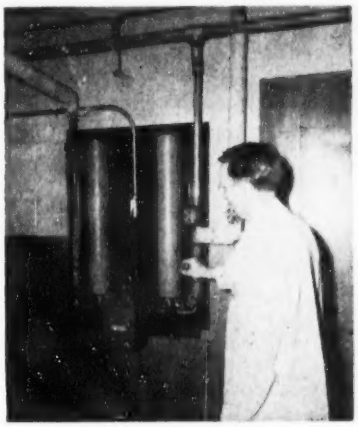
UP TOP is stoneware receiver with valves that determine amount of recirculation. Operator adjusts center-pipe damper to balance air input and exhaust pressures.



CONTROL box at receiver has relays for poppet recirculating valves, which are actuated by temperature controllers mounted at three levels on generator. Box permits manual control.



INFUSION temperature is gaged at three levels from deep in charged wood shavings inside unit. The indicating devices have electric contacts for actuating valves in recirculation system.



COOLING control of recirculating infusion is via sparging line's temperature controller bulb. This causes solenoid valve (seen center) to feed cooling water to heat-exchanger.

well, and lead around the wall to each generator. Also, a pipe from the same well brings in bonded 188-proof alcohol and fermented corn sugar mash.

Generator Details

The generator consists, essentially, of an air tight tank with a drainable, false bottom about a fourth of the distance up its side. This upper section is closely packed with beechwood shavings. Below is a collecting section that holds 7,000 gal. of vinegar.

In action, the beechwood shavings are impregnated with acetic acid bacteria furnished by soaking and absorbing about 4,000 gal. of high quality vinegar. Mash is then permitted to trickle through these charged shavings, with air rising countercurrent to the trickling liquid. Oxidation of the alcohol to acetic acid takes place—by dint of bacterial action—in transit. And the effluent drops through the false bottom into the collecting tank.

Using old style generators, this initial trickling, or percolation, would be the end of the acetification process, producing a rough vinegar which improved only on lengthy storage.

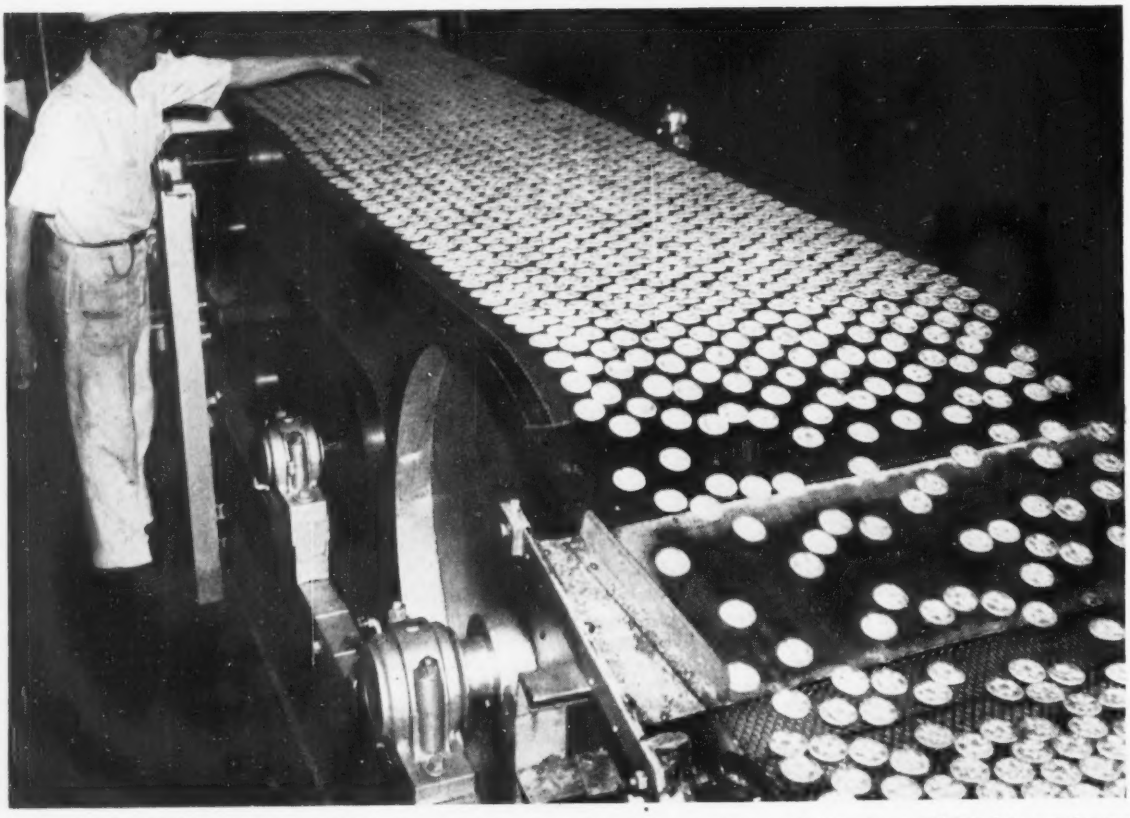
But it is here that the vastly improved efficiency of the new unit is offered—for by closing the system, using *forced* countercurrent air, and continuously *recirculating* infusion, it is possible to finish a 7,000 gal. batch with under 0.3 percent residual alcohol in less than ten days.

Controls Do It

Since the oxidation of alcohol by bacteria is an exothermic process, considerable heat could be built up in the generator as the infusion recirculates.

This could cause large losses of the highly volatile alcohol and acetic acid and also slow the reaction rate. But an ingenious system of automatically graduated circulation and integrated temperature control in the Frings unit keeps an optimum thermal balance at

(*Turn to page* 135)



TOP-PERFORMANCE INSTALLATION. On smooth-surfaced wire belt, crackers exit from long 800-deg.-hot continuous oven. Then they gently slide onto wire cooling belt (foreground).

WIRE BELT CONVEYORS

How to Choose Them . . . How to Mount Them

PART I—Process conditions, belt length, and load determine right weave. And true efficiency is attained only by engineering drive, tighteners, supports, and guides to operation, load, weave

J. F. REID
Cambridge Wire Cloth Co., Cambridge, Md.

Largely due to the need of the food industry for improved sanitation in the handling of food-in-process, as well as to the pressing demand for increased operating efficiency, food manufacturers were among the first to capitalize on the advantages of wire-mesh conveyor belts.

Though many years of proving in food plants has established numerous assets for this type conveyor, these advantages can be realized only if a belt of the correct specifications is selected for each specific conveyor performance, and then properly installed.

So guidance is in order for those who face handling-in-process problems that a wire belt conveyor can solve. And if suggestions are followed, substantial gains are to be anticipated.

Wire-mesh belts are so fabricated that, when installed, they are continuous. Avoided are joints, couplings, or lacing. Furthermore, conveyor can be lengthened or shortened by the addition or removal of a section of belt, and without loss of the continuous feature.

Properly mounted and maintained in correct alignment, the belt will rarely need repair during a long useful life. Wire belt conveyors can be cleaned mechanically while running, therefore require little hand washing or sanitary maintenance.

Due to the mesh construction, food products can be washed and drained in transit. Also, air may be circulated to bake, dry, cool or freeze products as they are conveyed.

Though the wire from which belts are made imparts no flavor or odor to food products, the type or alloy of the wire can be varied to meet any corrosion-resistance requirement.

Finally, wire belts are not affected by temperature between the low processing range required for quick freezing and the high employed for baking.

Use Indicates Weave

Although there are nine basic weaves by which wire mesh belts are fabricated, only five are in general use (see photos) as free belt conveyors in food manufacturing. The "captive" belt (wire mesh suspended between supporting chains) will be discussed separately.

The five weaves differ in size of mesh opening, weight per sq. ft., tensile strength, and smoothness of surface. Lowest in cost is the sectional belt. It has least tensile strength. Nevertheless, this type enjoys the asset of controlled travel—attained by attaching together short sections of right and lefthand woven fabric. Thus, each tendency to creep right is counteracted by one to creep left.

Because of the relatively large mesh, initial cost is lowest of the five weaves. However, food plant applications are limited. Most logical is conveying of light materials of large area, such as spinach and other leafly greens. Other lightweight items, such as potato chips and popped corn, can be both conveyed and screened on such a belt.

Another fabrication fairly low in cost is the balanced belt. It not only has high tensile strength but assures straight belt travel with high resistance to distortion strains. Also it eliminates any tendency to creep to either side of the drive pulley, thus, operating stresses are balanced to prevent localized distortions or destructive strains.

These advantages are accomplished by joining, with crimped connecting wire, a clockwise wound spiral to one formed counterclockwise. Each spiral is hinged free of its complementary wire, thus avoiding the angular contact of spirals hinged together.

In addition to providing straight hinging of spiral wires, crimped transverse connectors reinforce belt structure to minimize belt elongation or width contraction.

Because of its versatility, the balanced belt weave is most popular. Porous construction makes this belt ideal on dumping, draining, sorting, and other processing conveyors. Products such as berries, fruits, and small vegetables can be prepared and transported simultaneously. Weave is also ideal in freezing units for such items as lima beans and sliced carrots. From the time cut until canned or quick frozen, French fries and shoe-strings are usually balanced-belt conveyed.

Third type of belt, the duplex, is woven with pairs instead of single spiral wires. Decreased is the percentage of open area and increased is the per-foot weight of the belt. Rod reinforcing of this belt provides more tensile strength than in the two former types. Doubling the spirals increases surface smoothness.

These characteristics make the duplex suitable for use in grain dryers and cereal coolers, also on rigid-container unpackers and feeders.

Similar to this weave is the gratex, except that here, to produce a semi closed mesh structure, spirals themselves are more closely wound. Straight connecting rods are therefore required instead of the crimped type used in the balance belt. Advantages of the latter are retained with additional structural strength.

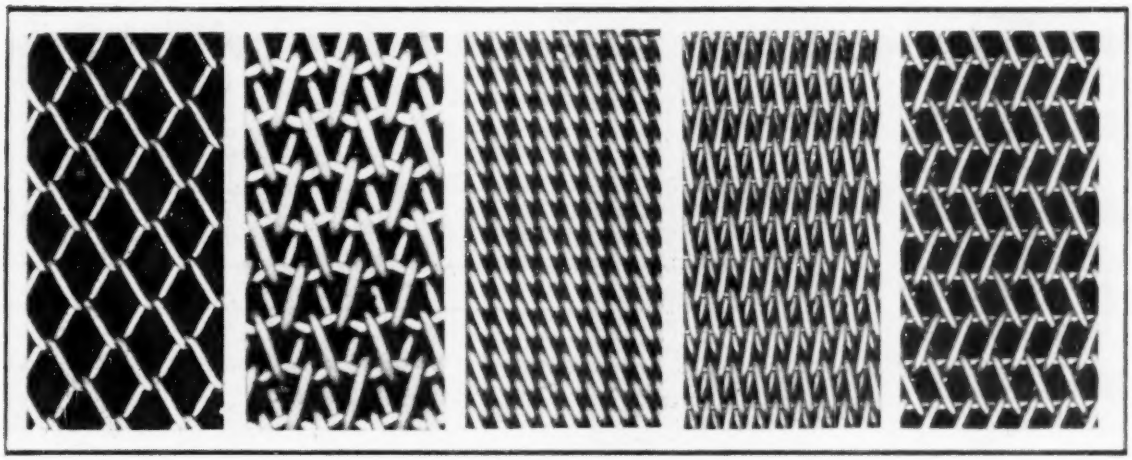
Major food applications are in spray, fog, and immersion coolers; hydromagnetic crate loaders; and freezing tunnels.

Except for a greater angle of weave, the double balanced belt, last of the five, is patterned after the gratex belt. Angle is increased by placing pairs of spirals in right and lefthand sequence, with connecting rods crimped on open meshes, straight on those closed.

This weave provides mesh openings larger than can be obtained with gratex weave. However, utility of belt falls into the general category of the belt with balanced weave.

Chain Supported Belts

In addition to the five free belts, two of another type are frequently employed in food processing. Wire fabric on these—the printle and roller chain conveyors—is supported by cross-members bridging drive-and support chains. Transverse wires, passing

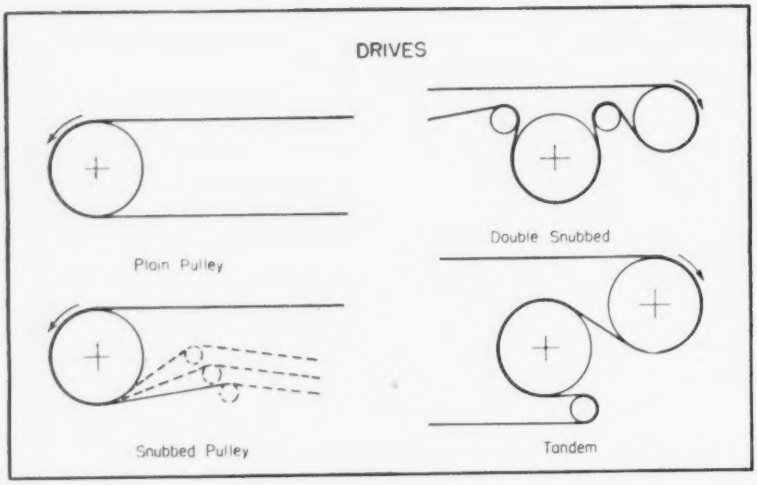


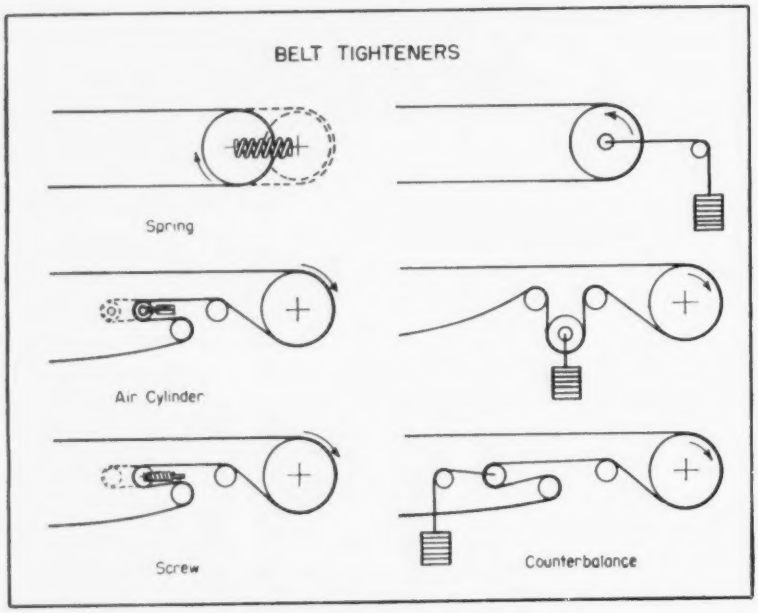
Wire Belt Weaves

—that are most commonly employed on food plant conveyors are illustrated above. They are (left to right): Sectional, balanced, duplex, gratex, and double-balanced. Table (right) gives their weight and strength for different wire gages.

Weight and Strength Ranges of Five Weaves for Each of Three Wire Gages
(Cambridge Wire Cloth Co.)

	14 Gage		16 Gage		20 Gage	
	Weight (lb. per sq. ft.)	Tensile Strength (lb. per ft. of width)	Weight (lb. per sq. ft.)	Tensile Strength (lb. per ft. of width)	Weight (lb. per sq. ft.)	Tensile Strength (lb. per ft. of width)
Sectional weave	1.13	9,000	1.25	6,720	.90	4,500
	1.20	9,600	1.56	8,592	.....	.....
Balanced weave	.75	7,260	1.38	12,540	.94	8,020
	4.13	36,180	3.50	26,520	1.10	9,600
Duplex weave	3.38	31,380	3.25	25,800	2.50	15,540
	5.31	41,040	4.40	30,180	.....	.....
Gratex weave	4.25	28,980	1.75	19,860	1.44	11,100
	4.50	39,840	4.00	26,520	.....	.....
Double-balanced weave	2.56	25,920	1.00	8,820	1.88	11,400
	3.70	30,180	3.00	22,080	.....	.....





through each side of every wire spiral of the fabric, may support the belt, or rods between sections of fabric may carry the load.

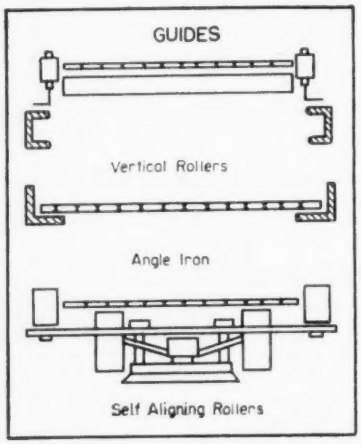
Though often constructed of lightweight fabric, this type assures smooth transportation of heavy loads over long distances with minimum power requirements. Bread cooling conveyors are frequently of this type, as are conveyors transporting up an incline. Feed conveyors to washers, blanchers, cookers, and coolers are also usually chain supported and driven.

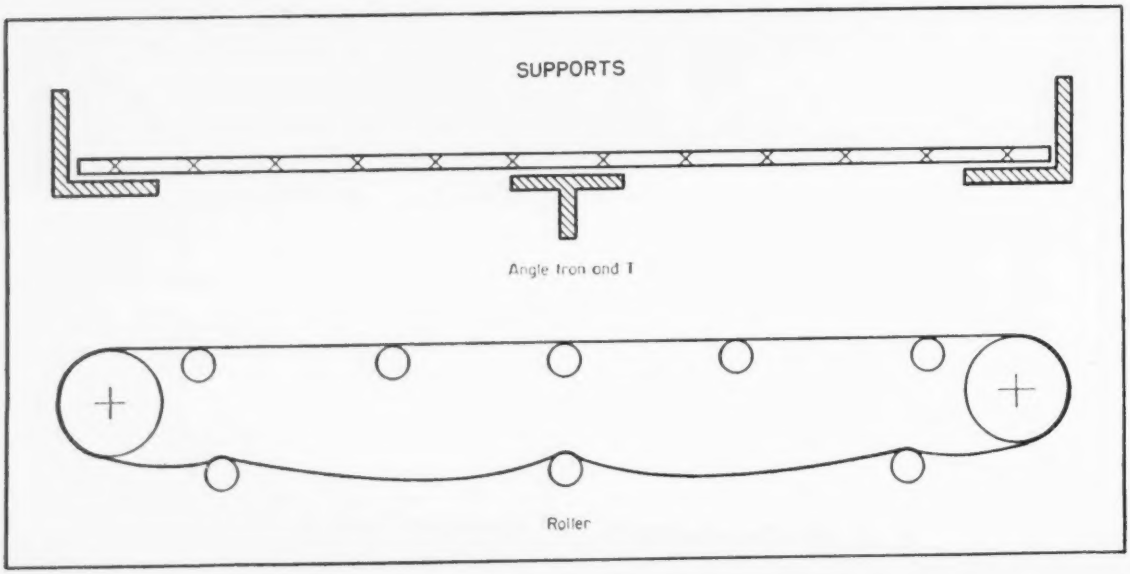
Shun the "Hit or Miss"

Assets of precision weaving and the craftsmanship of the fabricator in producing an essential type food plant conveyor belt—is lost if the unit selected is inadequate for the job.

Likewise, the value of a belt is diminished if any of the other elements of the conveyor—drive, idler and

(*Turn to page 166*)

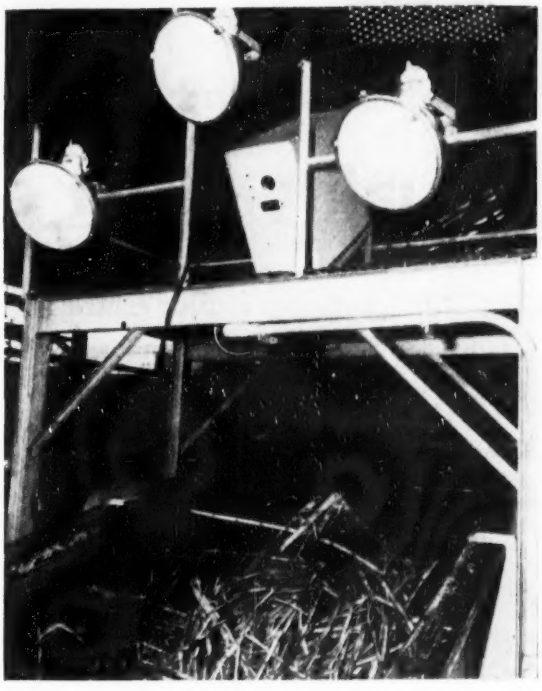




INDUSTRIAL TV

Eyes It for You

★ **"Sees" how much cane is coming on four different conveyors in sugar mill—thus enabling control by one man at remote station**



MUCH SMOOTHER flow and a decided reduction in jam-ups of cane pouring into the mills are now highlighting the operations at two Hawaiian sugar plantations, Ewa and Waialua.

Industrial television does the trick.

At each of the plantations, the TV setup permits a single operator to keep an eye on cane flowing along four different variable-speed conveyors running between cleaning plant and grinding machinery. Each operator's job is to control the conveying systems (250 ft. in length) in a manner which not only prevents pile-ups of cane but moves it fast and uniformly.

Both plantations are using closed-circuit TV systems, comprising cameras, coaxial cables, and receivers.

The camera units are installed at points which are in the open. Thus, keeping the camera lenses free of dust was a big problem. It was solved by mounting the cameras above and beyond the reach of dirt and spray, with due consideration to the winds. The "eyes" are enclosed in dust-proof cases with extra glass in front.

The cameras "picture" the cane as it moves into the mill conveyor. And the images are transmitted via the cables to the control center where the operator is watching.

Installation cost—about $7,500—is expected to be made up in about one year by nature of the new feeding efficiencies. Labor needs have been cut in half, since two men formerly were required at the control work at each mill.

Waialua had once tried to use mirrors for this conveyor control, but vibration and dirt made this unsatisfactory.

The TV installations are part of broad improvements at the plantations. Waialua has installed a new cane storage and conveyor system, also has converted from railroad to truck-trailer operation. And Ewa has re-arranged its crushing plant.

Checking the Mistreated Product →

1 **FLAVOR** of reconstituted concentrate must be comparable to juice from fully mature oranges. Off-flavors call for rejection of entire lot.

2 **RECONSTITUTED** samples are checked visually after 4 hr. at room temperature. Separation, as seen in tube on left, calls for rejection.

Their "Abuse" and Field Tests Assure

Quality *After* as Well as *Before*

In addition to routine control steps, Minute Maid mishandles products to see if they still meet standards, then hawk-eyes them during distribution

CHARLES H. BROKAW

Chief, Quality Control, Minute Maid Corp., Plymouth, Fla.

Special new tests added to Minute Maid's quality control program are pointedly concerned with the abuse to which products are subject after leaving the plant.

Why such additional testing? Answer: To supplement standard plant quality-control checks that, in final analysis, only cover part of the full picture ranging from reception of raw materials to pouring of the drink in the home. Aim is further assurance that the consumer enjoys frozen citrus juice concentrates of A-1 quality.

A quality product may regularly be produced and shipped. But influencing the subsequent maintenance of quality are two factors over which the packer has had little control:

First is lack of proper knowledge or tendencies to carelessness on the part of distributors, grocers, and terminal warehouse operators in handling frozen concentrates.

Second is faulty handling of these products by housewives themselves—failure to hold them at 0 deg. or even at ice-cube temperatures.

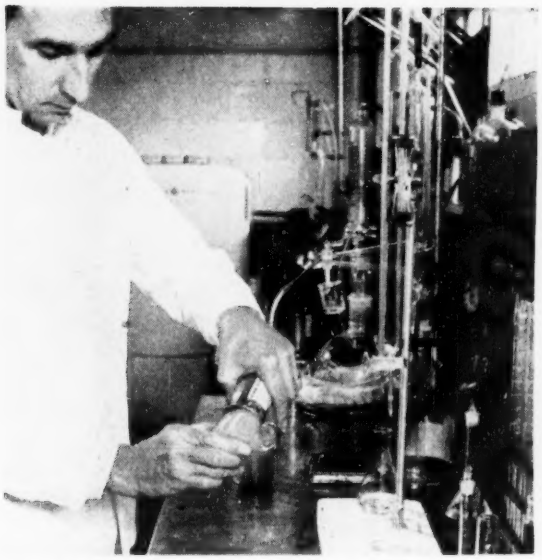
Citrus concentrates are especially sensitive to improper storage temperatures because of the naturally occurring pectin and pectinesterase enzyme. At all temperatures above 0 deg. F. the enzyme may act on the pectin and cause gelation and/or separation, both of which defects are potential consumer complaints. Reports from the trade have made it apparent that there is considerable abuse and resulting dissatisfaction with some citrus concentrates, and these faults made necessary some corrective action.

Like every quality-minded food maker, our company knows that reputation for products of consistent quality as they reach the housewife is its most important sales asset. That's why abuse testing and pertinent field checks have been added to our quality control program.

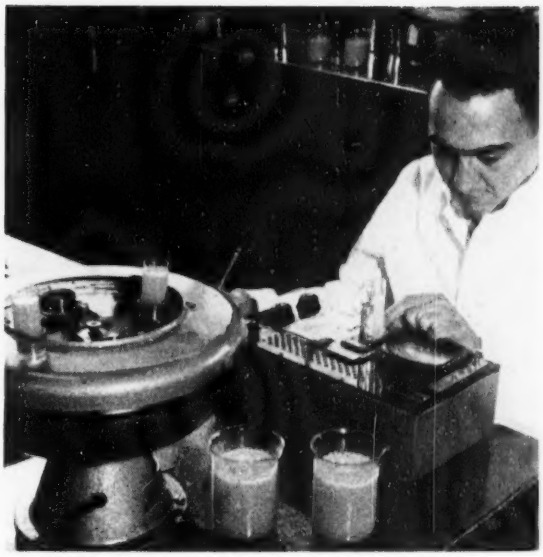
Carrying Out Abuse Test

A sample of the juice concentrate is taken hourly from the production line and then held for 48 hr. in a 40-deg.-F. refrigerator. Purpose here is to simulate abuse of product from time it leaves plant warehouses through handling by grocers and housewives. Over a period of three years, samples picked up in retail markets and analyses made of consumer complaints indicated the above test period, though severe, gave results similar to abuse found in the field. Thus, if product can perform satisfactorily under the test conditions, it will stand a much better chance of giving satisfaction to the consumer.

Before the product is released from



3 **GELATION TEST** is made after concentrate has been held 48 hr. at 40 deg. F. Gel must not be in excess of No. 0 on Minute Maid scale.



4 **COLORIMETRIC** separation is determined on hourly samples held 48 hr. at 40 deg. F. Allowable is maximum of 35 percent light transmission.

the warehouse, each hourly sample is analyzed for flavor, gelation, and separation. And product is rejected if it does not meet these typical frozen orange concentrate standards:

1. *Flavor.* The flavor of the reconstituted concentrate must be comparable to the juice from fully mature Florida oranges. Reconstituted product must also be free from fermented, spoiled, cooked, aged, scorched, or other off-flavors, though allowance is made for 40-deg.-F. storage.

2. *Gelation.* Concentrates held for 48 hr. at 40 deg. F. must not run in excess of No. 0 on Minute Maid's 0-to-4 visual gel scale (0, free-flowing; 4, stiff gel). Only exception is a tolerance of 10 percent of a day's production. In this case, concentrates must not exceed No. 1 on the scale.

3. *Separation (Visual).* Product reconstituted in test tubes is held 4 hr. at room temperature. If definite separation occurs, then product is rejected.

4. *Separation (Colorimetric).* Allowable is a maximum of 35 percent (or its equivalent) of light transmitted through a centrifuged sample of the reconstituted product, using Lumetron colorimeter with No. 650 filter.

Checks by Field Chemists

In April, 1951, the company assigned a field chemist to the quality control department. Working about 60 days during the summer, he reported violations of good practice at all levels of the distribution system. He corrected many of these and instructed distributors and retailers on proper handling practices. Employing the findings of his regular reports, the company followed through with warehouses on correcting defects.

This initial field program proved so satisfactory that a quality control chemist was assigned permanently to the New York sales office, though still reporting to the chief of quality control. Acting as trouble-shooter and technical adviser to sales personnel, he keeps continual check on handling of products in the Northeastern area.

Then in the summer of 52, the project was expanded, with two additional quality control chemists, from the Florida plants, being assigned—one in the middle Atlantic area and the other in the Chicago area. They were equipped with centrifuge, colorimeter, and other laboratory equipment. These chemists checked samples from distributor and terminal warehouses, tested the product at various retail points, and continued the company's educational program.

Response to the program was excellent, both from results obtained by Minute Maid and from reactions by warehousemen and grocers. And today the firm is in the process of expanding this program even further.

Of course, abuse tests and field checks are backed up by the company's routine quality control checks at various points along production lines. At each citrus plant, many of these tests are carried out by USDA men, since those plants are under "continuous inspection" of the Production & Marketing Administration.

Fresh juice is checked hourly at each plant for Brix, amount of citric acid, flavor, aroma, and color. It is also analyzed three times during each 8-hr. shift for peel oil (percent), defects, insect fragments, and mold (Howard method). In the event of unusual conditions—such as borderline maturity, broken finisher screens, mechanical failure—the juice is tested at half-hour intervals.

The concentrate is checked every half-hour for Brix, citric acid, flavor, aroma, color, defects, evidence of separation, and fill of container (by weight). Twice during each 8-hr. shift, the concentrate is tested for percent of pulp, peel oil, and light transmission, mold and insect fragments, and product temperature (in can).

Other control checks are on:

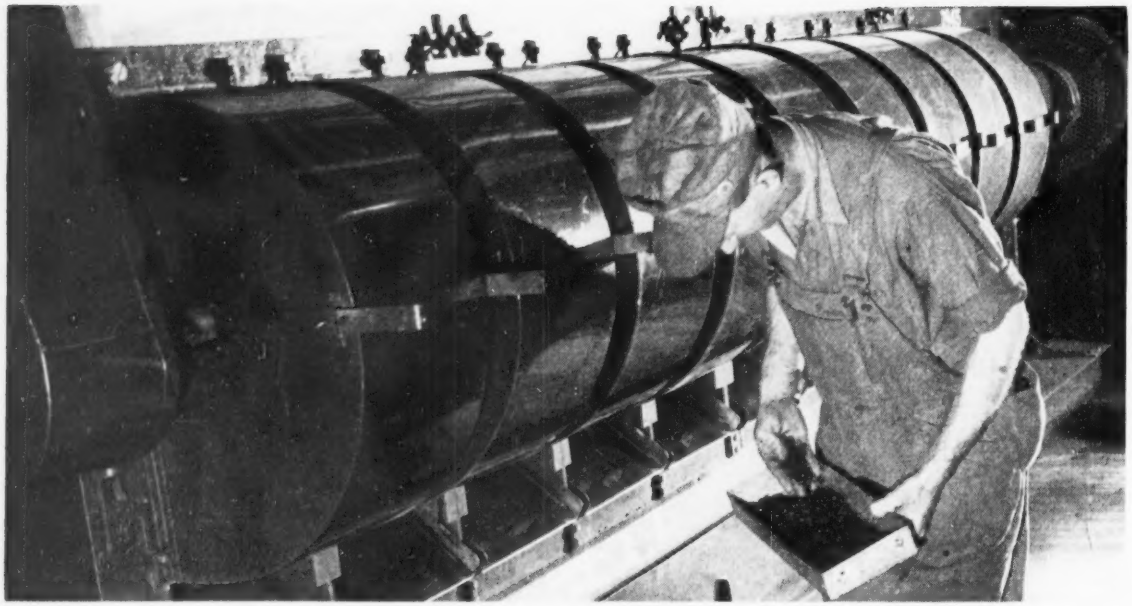
1. Free chlorine content of the service water during each shift.

2. Amount of pectinesterase enzyme in fresh juice and finished concentrate (twice daily).

3. Total viable bacteria on samples of finished products (hourly).

4. Microscopic examination of at least two fresh juice and two intermediate concentrate samples for bacteria and yeasts (each day).

5. Microbiological line checks throughout entire plant (daily). These cover contamination of surface of fruit before and after washing and before extraction, juice going to finishers and evaporators, concentrate from first and second-stage evaporators, and finished product leaving freezer.



KEYS to processing quality chocolate products at Walter Baker are selecting best cocoa beans and carrying out refining operations under rigidly controlled conditions. Products are constantly spot-checked all along production line. Here, worker is examining nibs separated from cracked, roasted nibs at the fanning machine.

KNOW-HOW

In Processing Modern Chocolate Products

FE STAFF

Higher than ever before are the attractiveness of foods, their appetizing values, and their eating qualities in the field of modern chocolate-product items.

And so broadly has chocolate now been developed—in number of specific types and uses—that the old "unsatisfactory generalizations" have long since ceased baffling the user. Instead, he now has fitting types readily available for every precise requirement.

The product lines prepared at the Dorchester, Mass., plant of Walter Baker Chocolate & Cocoa Division of General Foods Corp. particularly exemplify the strides made. They further bear out how advances are continuing.

For instance, a notable recent development is the bulk-form liquid chocolate coating. By-passing the 10-lb. cake-molding operation, chocolate is pumped in liquid form to 3,000-gal. capacity tank trucks for direct shipment to users. Arriving at the user's plant, the chocolate is then pumped into jacketed holding tanks. From here, it goes directly to tempering and enrobing units. In this way, considerable handling is eliminated, since chocolate-breaking machines and melting kettles are abolished.

Advantages of Bulk Handling

To the refiner, liquid chocolate means a saving through striking out several operating steps. Omitted are: Depositing into 10-lb. cakes, cooling, packing into 50-lb. lots, warehousing and transporting cases of solid coatings.

Savings effected are passed onto the user in the form of a price differential between liquid chocolate and 10-lb. blocks packed in shipping cases.

In-plant savings result from omission of several unit operations and increased smoothness of production. These are:

1. Labor savings. Steps attendant on handling cases of chocolate coating are omitted.

2. Storage-space saving. Storage tanks can be built from floor to ceiling, utilizing all vertical space (as compared with the practice with cases, which are usually stacked leaving considerable wasted space between top level and ceiling.

3. Improved appearance and sanitation. Handling of liquid chocolate is in a completely enclosed system. Also continuous operation is feasible.

4. Uncontaminated product. Liquid chocolate is not subject to dust and lint from containers.

5. Uniform quality. Danger of scorching chocolate when melting is eliminated.

But there are also certain disadvantages in this bulk method. Since the liquid chocolate must be immediately

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Here's complete coverage on best ways of using today's wide variety of chocolate products in making different foods . . . New bulk-handled coating enables user to short-cut operations

used, aging—a pre-requisite for high-grade coatings—is impossible.

Also, scheduling of deliveries must be right on the button, otherwise entire production lines will remain idle. Also, the user must have ample storage facilities to hold surplus stock in the event of failure in delivery.

Varieties of Beans

Now we shall get back to types of chocolate products. Walter Baker classifies cocoa beans into the flavor and base groups. Flavor beans of the Criollo group are plump and thin-skinned, and contain a large amount of volatile oils. Base beans of the Forastero group are thick-skinned and supply the basic flavor of chocolate.

In the Criollo group are the Caracas, Puerto Cabello, and Maracaibo. Included in the Forastero group are the Accra, Bahia, Lagos, and Sanchez.

Handling Coatings and Liquors

Walter Baker makes the following suggestions to confectioners on handling coatings and liquors to assure quality finished products. Thus, coatings will be uniform and they will have good gloss and maximum coverage.

Sweet coatings and liquors should be melted at 120 deg. F., with agitation to prevent separation of cocoa butter and subsequent graying or streaking of the chocolate. Temperatures exceeding 120 deg. F. will offset the care exercised in refining of coatings and liquors. Steam or water must never come into contact with the chocolate. And all the coating must be melted prior to tempering.

Proper tempering is essential for best results. Cold water should not be employed, for then a crust will form on the sides of the kettle or enrober. This crust will interfere with the transfer of heat in the tempering and enrobing units. It will also peel off into the chocolate and thicken it, making it difficult to handle.

Temperature of the cooling water should be about 70 deg. F. Minimum time recommended for tempering is 30 min. Milk coatings should be melted at 110 to 115 deg. F.—never above 120 deg. F.

Enrobing Suggestions

A coating for enrober-dipping is selected with a viscosity suitable for the size and shape of the center. Overheating to obtain a thin flow or increasing enrober-fan velocity are unnecessary if a coating with the correct viscosity is selected.

Best enrobing-temperature range is 88 to 90 deg. F. Above it, the color of the coating is usually poor. Working-room temperature should be 75 to 80 deg. F., and the relative humidity 40 percent.

Recommended temperature of centers is 70 to 75 deg. F. If the enrober is adjusted improperly and there are higher temperatures, "big bottoms" are likely to be caused or imperfect setting of the coating. Excessively warm centers produce a delayed bloom. Cold centers crack the coating.

Temperature in the cooling tunnel should be adequate to gradually solidify the entire chocolate. Mild cooling at 55 to 60 deg. F., with gentle air currents, usually sets coatings within 10 to 12 min. Average temperature range, with air currents, is 45 to 55 deg. F., and short exposures at 40 to 50 deg. F. assure good gloss. Ideal tunnel operation—where long exposures are possible—is 65 deg. F. at the entrance and 45 to 50 deg. F. at the discharge. Too rapid cooling dulls the finish or causes blooming. Tempering the coating prior to enrobing is paramount.

Cocoa butter melts at approximately 91 deg. F. and sets at 85 to 86 deg. F. Therefore, rapid cooling of the coating will result in the crystallization of a certain percentage of cocoa butter. It is impossible to melt this butter, unless the mixture is re-heated to 92 deg. F.

Common bad practice is to cool a coating rapidly until it congeals or "freezes up." The operator then thins the coating with hot chocolate. In this case, the cocoa butter that has already congealed will bring about the gradual crystallization of more butter in the chocolate solution. This gradual heating-up process is necessary here because of the additional butter crystallization. When the coating reaches 92 deg. F., the chocolate immediately runs very thin. It is then necessary to cool it. And this procedure may be repeated several times daily.

A better method is to slowly cool the chocolate—with 65-70-deg.-F. water—to 86-87 deg. F., then raise the temperature to 89-90 deg. F. It is possible to operate considerably longer at this temperature range without repeatedly heating and cooling the chocolate. Adequate stirring and scraping of the kettle walls are necessary, however, to prevent formation of congealed butter.

Hand-Dipping Recommendations

Ideal temperature for hand-dipping is 85 deg. F. for sweet coatings and 80-84 deg. F. for liquors in a room maintained at 64-70 deg. F. Whatever the skill, gloss and snap are unattainable at a working-room temperature above 70 deg. F. After setting under this condition, the chocolate appears dull and streaked. Even after the chocolate is cooled to 84 deg. F., these defects may become pronounced when the humidity is high. It is advisable to cool coated centers on racks at 50-55 deg. F. prior to packing.

Suggested method for hand-dipping is to heat the coating to 115 deg. F., cool slowly to 82-84 deg. F., and dip at 84-86 deg. F. Milk coatings should be dipped at 82-84 deg. F. and liquors at 80-84 deg. F.

Excessive cooling of machine or hand-dipped centers is undesirable. Water condenses on the coating and results in immediate sugar bloom or blooming at a later period.

Coated centers should be packed and stored at about 65 deg. F.—never above 70 deg. F.

Chocolate coating or liquor must be stored in a cool, dry room. Temperature of the room should not exceed 75 deg. F. It should be maintained at 60-65 deg. F. with a 50 percent relative humidity.

CHOCOLATE LIQUORS milled from nibs representing individual varieties of beans are mixed in huge storage tanks to produce various blends.

Chocolate suddenly removed from storage to areas 20 deg. higher in temperature may "sweat". In turn, this moisture on the surface of the chocolate may adversely affect it—causing a mustiness or sugar crystallization.

Vanilla coatings improve under proper storage. They mellow after 3 or 4 months. Under ideal conditions—proper temperature and humidity—chocolate can be stored a year or more.

Storing Coatings

Proper storage of chocolate-coated candies calls for uniform temperature, low humidity, and freedom from foreign odors.

The most satisfactory temperature is about 65 deg. F. Lower temperatures have been successfully used, but greater precautions are necessary when making withdrawals. Abrupt temperature changes may cause chocolate to sweat and lose gloss.

High relative humidities bring about loss of gloss or produce bloom. This is attributed to surface crystallization of sugar.

Temperature and humidity go hand in hand in contributing to proper storage. Abnormal temperatures or high humidities condense moisture in the atmosphere. The moisture, in turn, dissolves the sugar. When the room then becomes dry, the dissolved sugar crystallizes and adversely affects chocolate gloss.

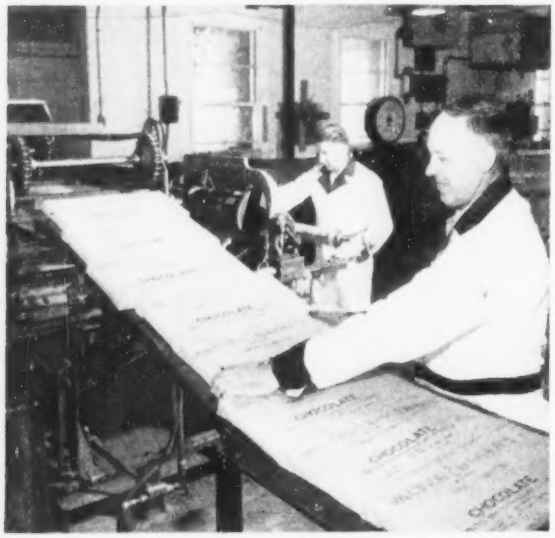
Recommended temperatures and maximum humidities are 60-65 deg. F. and 45 percent for 30 days; 60 deg. F. and 50 percent for 90 days; and 50 deg. F. and 55 percent over 90 days.

Chocolate candies stored at 60 deg. F. should be conditioned to 67 deg. F. for at least 3 days before shipping. Those stored at 50 deg. F. should be conditioned to 67 deg. F. for at least a week. (This is not necessary in cold weather.)

Foreign odors are readily absorbed by chocolate candies or the chocolate itself. When stored in the same room, chocolates will pick up odors from such products as coffee, citrus fruits, or vegetables. If any of these items have been previously held in the same location, it is not advisable to store chocolate until the room has been properly aired.

Some types of chocolate-covered candies do not hold up well in storage—particularly those with centers containing low-melting point oils. For example, roasted nuts of a brittle-type candy will turn the chocolate gray—due to nut-oil seepage into coating and later loss of gloss.

Chocolate-covered caramels are likely to suffer the same way. Milk fat set free during cooking penetrates the coating and causes graying. This action can be somewhat reduced by applying more coating to the pieces.



MOLDED, 10-lb. slabs of chocolate for use in preparing coatings are machine-wrapped and cased for shipment to bakery, candy, and ice cream trades.

Storing Cocoa Powder

It is important to store cocoa powder at temperatures below 91 deg. F.—the melting point of cocoa butter. If the cocoa butter is subjected to alternate melting and freezing, the powder cakes. When the butter freezes on the surface, it discolors the powder.

Cocoa powder must also be stored in a relatively dry atmosphere. At higher humidities, the powder takes on a musty or moldy flavor. The maximum safe relative humidity for the storage of cocoa powder is 60 percent.

Problems in Meeting the Standards

The use of the "poly" emulsifiers in chocolate candies materially reduces fat bloom. However, their use in chocolate coatings is prohibited by the Standards of Identity established under the Food, Drug & Cosmetic Act of 1938.

It is generally agreed that milk chocolate-coated goods are less subject to bloom than dark-coated items. But there is one drawback to them. They may be too sweet for certain types of centers.

The sweetness of milk chocolate can be reduced by substituting skim milk powder for part of the sugar in the formula.

But here's the disadvantage in doing this: The chocolate standards prescribe a specific ratio between milk fat and non-fat milk solids. And if additional skim milk—above the amount permitted by this ratio—is used in a formula, the standards require that the product be labeled "mixed milk and skim milk chocolate." This label declaration is considered cumbersome, and it has an unsatisfactory connotation.

Standards have created another problem. They specify that a milk chocolate must contain a minimum of 10 percent of chocolate liquor. When ordinary base beans are used for making milk chocolate, the color resulting from 10 percent liquor is too dark for certain types of confections. It is possible to make a light colored milk chocolate with certain flavor beans.

Types of Products

Manufactured by Walter Baker are eleven major chocolate products, tailormade for the confectioner, baker, dairyman, and others:

1. Chocolate liquor is the product resulting from the grinding of roasted cocoa nibs. It must contain at least 50 percent cocoa butter fat. And, depending upon the quality and type of beans, it may have as much as 55 percent fat. There is generally a variation of 1 to 2 percent in the fat content of any liquor due to the natural variation of fat in the cocoa bean.

Quality of the chocolate liquor depends upon the blend of cocoa beans, skill in roasting and blending of the nibs, and the fineness of the grind of the liquor.

Chocolate liquor is extensively used in the baking and ice cream fields and to a considerable extent by the confectioners and syrup manufacturers.

Pure liquors are of rich chocolate flavor and color. They are specially processed to eliminate strong and bitter flavors. They are produced by carefully controlled blending, roasting, and milling designed to insure full-

ness of flavor, free-flowing properties, and smooth appearance.

2. Vanilla coatings are the most popular type for quality candies. Offered are a wide variety in color, bean blend, and strength of vanilla bouquet.

Each of the major markets prefers its own type. One area likes a heavy, dark vanilla. Another wants a black coating with a mild but thorough bouquet. And still another prefers a coating with a seal-brown color and bland flavor.

3. Milk coatings are becoming more popular. In a great many instances, they are rapidly replacing light sweet coatings.

4. Light and dark sweet coatings are generally used for coating 5c. bars, peanut clusters, and some panned and molded goods.

Light sweet coatings are very sweet, since they have about 15 percent liquor, 60 percent sugar, plus added cocoa butter.

Dark sweet coatings are generally available in three viscosities—medium for enrobing, thin for lighter coverage, and extra thin for biscuits.

Others have added liquor to deepen the color. These are popular for bars with very sweet centers.

Bittersweet coatings are a combination of chocolate liquor and sugar. They are popular for cocoanut centers. Some flavored with vanilla are used for sweet centers requiring a thin viscosity.

5. Chocolate bits are small molded pieces running 125 and 250 to an ounce available for the manufacture of chocolate chip cookies. Because of their size, they can be easily used on cookie depositors.

6. Chocolate shots are small, extruded pieces, covered with a fine glaze for the bakery and ice cream trades. They are generally available in light or dark shades, and in short, medium, and long sizes.

7. Chocolate liquor and cocoa powder mixture is easily dispersed into an ice cream mix. It produces a pleasing, dark red-brown ice cream with a heavy chocolate character. The cocoa butter content is 38 to 40 percent.

8. Chocolate flakes are used for chocolate chip ice cream. The flakes are soft enough to add to ice cream yet, upon contact, do not harden excessively. Brittle enough to "eat well," they yield a pleasing chocolate character. They are readily dispersed in an ice cream batch in continuous or batch-type freezers.

9. Chocolate ice cream coatings are processed to produce a high quality flavor and color (light to dark). They cover ice cream well, resist moisture absorption (mushing), and run freely. No additional fat is required since they have approximately 53–58 percent fat.

These coatings are handled in this manner:

Broken-up chocolate coating is placed in a jacketed kettle, where it is heated (not over 120–125 deg. F.) and stirred until completely melted. The melted coating is slowly cooled with stirring to 100–110 deg. F.—the recommended dipping temperature for a firm and hard block of ice cream. Soft cream causes the coating to "mush" or "fudge" due to excessive moisture absorption. It also results in improper adherence of the coating to the block.

10. Vegetable oil coatings consist of cocoa, sugar, and vegetable oil in place of cocoa butter. Lecithin is added to resist moisture absorption. They have a much higher melting point than cocoa butter coatings. They are favorably received in the South and Midwest and by small manufacturers with little equipment.

These coatings should be melted at 110–120 deg. F. and thoroughly mixed in a jacketed kettle. The ice cream bar should be firm before dipping, and the coating should be between 105-110 deg. F., depending on the coverage desired, otherwise the drying qualities will be impaired.

11. Cocoa powders are manufactured for the bakery, ice cream, and syrup fields. Color and flavor comparisons are only made by mixing the cocoa powder in water or, in some cases, in milk. The color of cocoa when dry is purely a physical state of the powder denoting the degree of tempering. This appearance cannot modify or change the color or true flavor of the cocoa powder in solution. A badly faded powder will produce a syrup, baked cake, or milk drink that is exactly the same as one made from a good-colored cocoa powder.

NEWEST method of shipping chocolate coatings. Melted product is fed into large trailer that delivers it ready-to-use anywhere within 200 miles.

Fineness grades of Walter Baker's cocoa powders are: (1) Fine, (2) very fine (syrup fineness), and (3) superfine.

About 99.5 percent of the fine powder passes through a 100-mesh screen. Approximately 99.99 percent of the very fine cocoa passes through a 100-mesh screen.

Superfine cocoa powders are recommended for chocolate milk drinks and syrups, where instant dispersibility, freedom from specks, and low cocoa-butter content are essential.

For chocolate milk drinks, approximately 10 to 12 lb. of cocoa powder is added to 100 gal. of milk.

Preparing Milk Drinks

And now to some of the uses for chocolate and cocoa products:

Chocolated milk drinks are usually manufactured with fluid or powdered skim milk, sugar, cocoa powder, and flavoring. It is also common practice to add stabilizers to retard settling of chocolate products.

It is difficult to supply specific directions on processing, since the manufacture is dependent upon the equipment available. Wherever possible, a homogenizer should be used, since a more satisfactory product will result from thorough blending and dispersion of the chocolate flavor, also improved non-settling properties.

Standard chocolate syrup can be prepared in the dry state or in the form of a syrup. A base formula in which cocoa powder is added directly to the mix comprises: Cocoa powder, 10–12 lb.; sugar, 45–46 lb.; fluid milk, 100 gal.; and stabilizer (if desired).

A formula in which the chocolate is made up as syrup and then mixed with the fluid milk consists of: Cocoa powder, 10 lb.; sugar, 45 lb.; water to make 10 gal. of syrup, 5 gal.; and stabilizer (if desired). Here, the cocoa powder is mixed with the sugar. Water (heated to 180 deg. F.) is slowly added, with efficient agitating to make a smooth paste. The syrup is boiled 1–2 min., cooled, and stored in clean, loosely covered containers. A gallon of the syrup is added to 10 gal. of fluid milk to make a chocolate milk drink.

A low-fat, high-solids mix containing cocoa and malt

is recommended for frosted malteds. Here's a formula: Ice cream mix (12 percent), 1.8 gal.; condensed skim milk (26 percent), 41.5 lb.; sugar, 12 lb.; corn sugar, 2 lb.; cocoa, 2.2 lb.; gelatin, 2 oz.; pectin, 9 oz.; malted milk, 3 lb.; and water, sufficient for 10 gal.

Making Ice Cream

Chocolate ice cream can be made from chocolate liquor, cocoa powder, or a combination of liquor and cocoa powder. A large manufacturer merely adds the chocolate product directly to the mix in his pasteurizer along with other dry ingredients. The batch is then pasteurized, homogenized, cooled, and frozen in the usual manner.

Sugar in the mix formula is generally increased over the amount used in plain vanilla mix to compensate for the heavier flavor of the chocolate product. The increase ranges from 2 to 4 percent, depending upon the amount used in the plain mix and the sweetness desired. A sugar content from 16 to 18 percent is common.

Serum-solids content may also be slightly lower than that in plain mixes to avoid a too high total solid content.

Small manufacturers purchase a prepared ice cream mix from the large processors. It is not practicable to add the solid chocolate product to the mix. There is too much risk of making an unsatisfactory ice cream mix. Therefore, it is necessary to make a syrup using the chocolate product, sugar, and water, and then add it to the prepared mix before freezing. The syrup should be cooled so as not to prolong the freezing operation.

Chocolate ice cream is difficult to freeze because it whips slowly. The viscosity of the chocolate mix may be reduced and whipping time improved by adding 1 lb. of sodium bicarbonate to each 1,000 lb. of mix. Dried egg yolk will also improve whipping and aid overrun.

High-fat chocolate ice cream often tends to be crumbly. This condition may be partially corrected by substituting 2 to 4 percent of corn sugar for an equivalent amount of cane sugar. However, if corn sugar is used, the ice cream will be softer. It will also melt more rapidly than an all-cane sugar mix. A lower homogenization pressure is also desirable, and the serum solids must be low.

Chocolate ice cream often turns greenish black along the surface of cans, especially if the can is rusty or has been scratched. Reason: Soluble tannins in the chocolate react with iron, forming a ferric tannin compound. Dutch-processed products react more readily since the tannins are more soluble. Solution to this problem is to use well-tinned cans or parchment paper liners.

General Defects

High viscosity of mixes may be lowered by increasing the pasteurization temperature (to about 165 deg. F.), reducing homogenizing pressure, and, if necessary, using less serum solids and gelatin in high total solid mixes.

Extended freezing may be due to an excessive amount of sugar or high viscosity.

Crumbly body is caused by excessive solid contents and high fat mixes.

Coarseness may result from slow freezing and hardening, or dilution of the mix with a chocolate syrup containing too much water.

Weak flavor is attributed to either a poor quality flavoring or an insufficient quantity of good chocolate flavor.

In making chocolate ice cream, 3 to 3½ lb. of chocolate liquor can be added to 5 gal. of ice cream mix. More or less liquor may be used, depending upon individual tastes as to color and flavor strength.

When a homogenizer is used, add the liquor directly to the mix in the pasteurizer. Then pasteurize, homogenize, cool, and freeze.

When chocolate is to be added to a prepared mix at the freezer, introduce it in the form of a syrup.

A syrup is prepared by melting 3 to 3½ lb. of liquor in a steam-jacketed kettle, together with an equal quantity of sugar and 160-deg.-F. water (2–3 qt.). The syrup is constantly stirred, heated to 180–200 deg. F. It is then stirred 5 min. for proper blending. Finally, the syrup is cooled and mixed directly into the ice cream mix, and the batch is frozen.

In making chocolate ice cream with cocoa, use 1¾ to 2 lb. of the powder to each 5 gal. of mix.

When a homogenizer is used, add the cocoa directly to the mix in the pasteurizer. After pasteurizing, homogenize, cool, and freeze.

When cocoa is to be added to a mix at the freezer, introduce it in the form of a syrup. Prepare the syrup by mixing 1¾ to 2 lb. of cocoa with an equal amount of cane sugar in a steam-jacketed kettle. Gradually add 2 to 3 qt. of 160-deg. F. water. When a smooth syrup is obtained, heat to 180–200 deg. F., stirring thoroughly for 5 min. Draw off syrup, cool thoroughly, mix directly into the ice cream mix, and freeze.

Making Chocolate Syrup

Walter Baker has worked closely with syrup manufacturers, and has spent considerable time developing cocoas and liquors specially blended and processed to comply with particular requirements.

To prepare a general use fountain syrup, mix 12 lb. of cocoa or 20 lb. of chocolate liquor, 0.1 lb. of salt, and 50 lb. of sugar in a steam-jacketed kettle. Then slowly add 10 lb. of 180-deg. F. glucose and 6 gal. of water, boil 2–3 min., and flavor with vanilla extract.

Other products manufactured with chocolate liquor or cocoa powder are milk chocolate syrup, hot chocolate fudge sauce, and hot fudge sauce.

Products for Bakeries

Chocolate liquor is available in 50-lb. cases, 10-lb. cakes (5 to the case), and 1-oz. pieces.

A pre-tested cocoa, made especially for the baking industry, contains 22 percent fat. It is uniform in pH, having been adjusted and neutralized by slightly Dutching the cocoa. Its color will not bake out, and it develops a fine, full chocolate flavor.

Another pre-tested cocoa is used for its color. In chocolate cake it provides a mahogany color. It is also uniform in pH and color.

Natural liquor or cocoa powder impart a penetrating aromatic character—the true chocolate flavor—to bakery products.

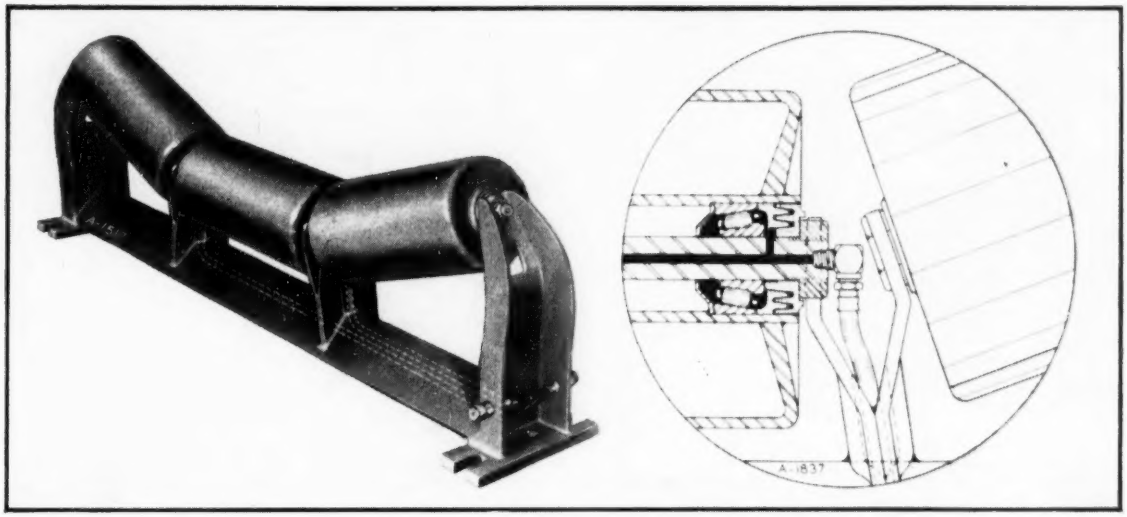
Dutched liquors or powders, on the other hand, are somewhat neutral. It is necessary, therefore, to use less soda for balancing the leavening agent. They impart a deeper color and a full-bodied flavor to the different products.

Chocolate chips are made of dark vanilla chocolate processed at a special viscosity. When baked into a cookie or cake, they do not soften to blend into the dough. Recent tests have shown that chocolate chips can be readily utilized in frozen dough mixes.

Small, glazed chocolate pellets are sprinkled on top of an icing as a cake decoration. They are also used by confectioners for topping certain pieces in box lines and by the ice cream trade for ice cream cones and fancy ice cream rolls.

Chocolate and cocoa products are also used in fudge icing, devil's food cake, chocolate chip cookies and nut squares, cream pie, frosting for doughnuts, and other types of bakery products.

NEW EQUIPMENT & SUPPLIES



New Belt Conveyor Carriers Are Easy to Lubricate

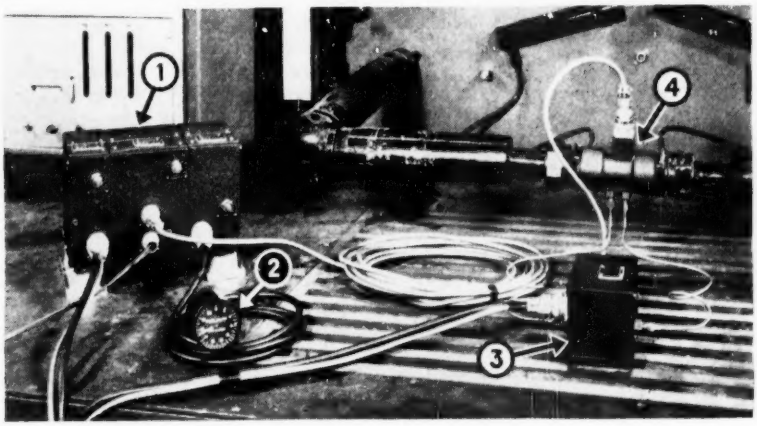
These new carriers, the 220 Series "Simplex," are said to be lubricated without the usual danger or difficulty in reaching under the moving conveyor belt for center-roll fittings.

Where a conveyor can only be lubricated from one side, the assembly illustrated above is required. All-steel frame is flanged, reinforced and accurately jig-welded for strength and elimination of unnecessary weight. Ribbed roller brackets provide room for lubrication tubes (see sketch) and permit close roller spacing for maximum belt support.

Each roller is spun from a single piece of steel tubing and is interchangeable in assembly. Inner tube is bored for Timken bearings and die cast labyrinth grease seals. Both bearings are lubricated through a single fitting in one end of roller shaft.—*Stephens-Adamson Mfg. Co., Aurora, Ill. and Los Angeles.*

Circle 101A on Reader Service Card

Electronic System Measures Liquid Flow in Pounds



Of interest to processors handling liquids is a new, compact electronic unit claimed to measure flow of liquid through a line in pounds rather than in gallons.

Illustrated above are four basic units in system. They are: (1) electronic assembly, (2) indicator, (3) density detector and (4) flow meter.

In essence, units measure flow in gallons but automatically compensate for weight of fluid, producing a continuous lb. per hr. dial reading.

Flow meter is comprised of cast aluminum housing containing magnetic pole inserts, density detector take-offs, and a mount for turbine type rotor. Rotor parts are designed to produce a venturi effect reducing pressure drop through the unit to a negligible figure. A permanent magnet is used to set up a magnetic field. Rotor cutting these lines of force in field reflects rate of flow.

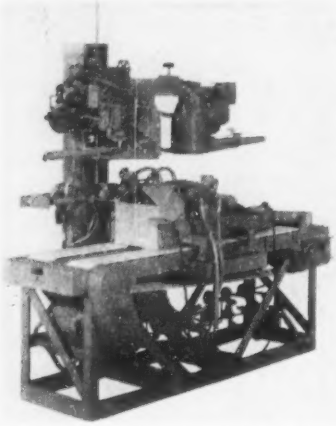
Two couplings lead from sensing element to density detector which continuously samples fluids passing through flow line. Unit then feeds results of sampling through a compensator to an integrator where density measurement is combined with volumetric measurement of flow meter to give a corrected figure in lb. per hr.

Assembly has been so designed that component parts can be used separately—flowmeter to read in gph., detector to measure density separately.

System was orginally designed for use in aviation industry to handle liquids having a specific gravity less than 1. Maker states system can, with modifications, be applied to other liquids—*Gavco Corp., 540 E. 80th St., New York.*

Circle 101B on Reader Service Card

Carton Stapling Machine Is Fully Automatic



Of interest to brewers and canners is this new fully automatic carton-stapling machine for closing center slotted corrugated or fibre cartons—the type used for packaging canned and bottled beer, canned foods, glass packed foods and a variety of other products.

Designed to fit into existing conveyor systems, machine is built to include a conveyor belt that receives filled carton from main conveyor system prior to stapling operation.

As carton is conveyed to stapling position, it hits a trip-switch which actuates a device automatically centering carton for proper cross-stitch stapling of top flaps.

While carton is being centered, it continues to move forward on conveyor belt until it actuates a second trip-switch causing an automatic mechanism to first close carton's end flaps . . . then its side flaps.

As soon as side flaps are closed, two automatic retractable anvil stapling heads lower to carton top, and drive staples at predetermined positions along center slot.

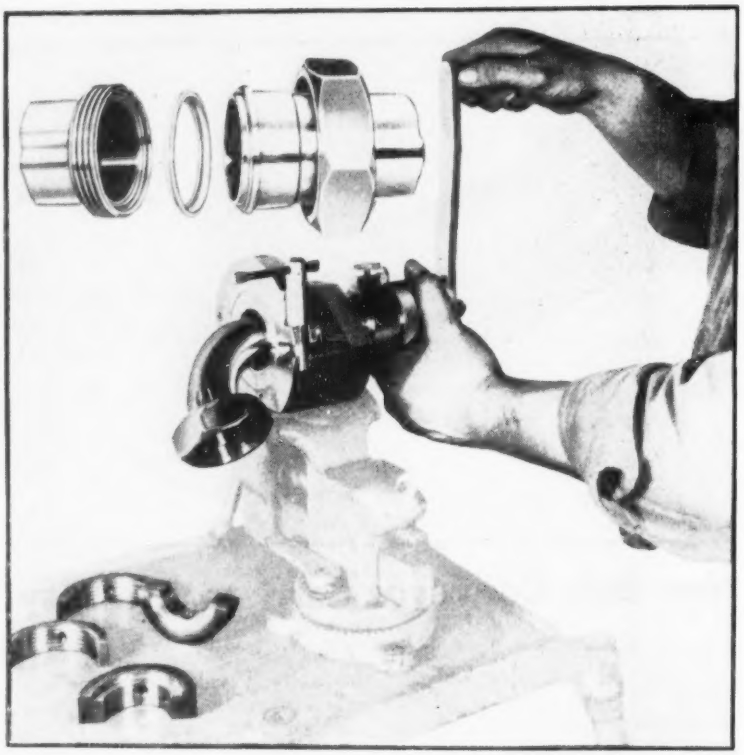
After staples are driven, forward limit switches mounted inside each stapling head are actuated. This causes anvils to retract into each stapling head, stapling heads to rise from carton top, and automatic centering device to open.

Carton then proceeds on machine's conveyor belt to main conveyor system.

Machine is air operated, and will staple from 800 to 1,000 cartons per hr. It is adjustable to handle cartons from 5 to 11 in. high, 8 to 12 in. wide, and 11 to 17½ in. long.—*International Staple and Machine Co., 801 Herrin St., Herrin, Ill.*

Circle 102A on Reader Service Card

Tool Simplifies Conversion of Sanitary Fittings



Fast, simple conversion of bevel seat sanitary fittings and unions to close-fitting leak-tight gasket seat joints to be used with regular "take-down" lines or for "cleaned-in-place" piping can be made with new "Super-Speed" conversion tool.

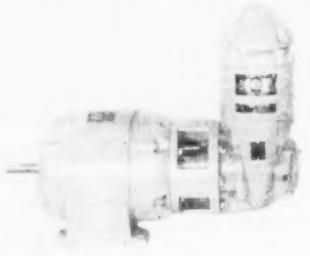
Converted fittings or unions will take special Hycar gaskets which are self-positioning, non-toxic, fat resistant, non-absorbent and can be sanitized by steam to 250 deg. F.

With use of tool, fittings can be converted without any dimensional change and damaged bevel seat may be reclaimed by converting to gasket seat. Converted fittings will have flush interiors, crack-free joints, and will be leak-tight. Present lines can be converted to "cleaned-in-place" lines and can be done progressively and used while change-over is in progress.

After present bevel seats are converted, line can be extended with Tri-Clamp fittings.—which consist of a flange type ferrule, precision molded gasket, and a spring clamp which grips ferrule edges with a snap-action toggle assembly.—*Tri-Clover Machine Co., Kenosha, Wis.*

Circle 102B on Reader Service Card

Multi-Motor Packaged Unit Provides Optional Speeds



Take-off speeds of 1750 and 100 rpm. are provided with this recently developed multi motor packaged unit. Other combinations of speeds are available in ratios as great as 100:1.

Packaged unit consists of a horizontal motor, a footless right angle worm gear motor and an over-running clutch.

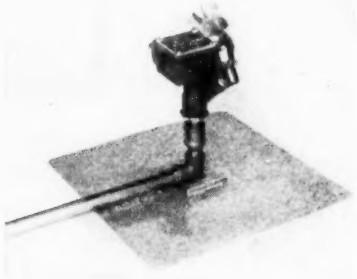
Termed silent in operation, unit avoids misalignment problems common to some multimotor applications by having but one mounting base. By means of a special bracket, right angle motor is assembled to horizontal Unidosed motor in factory, simplifying final installation of driven machine.

This particular unit, designed pri-

marily for a dry-cleaning application, operates as follows: The 50 min. cycle begins with a 15 min. washing period during which motor is driving equipment at 100 rpm. Because of operation of over-running clutch, gear motor drives through horizontal motor. Then, for next 3 min. extracting period, horizontal motor is energized and spins material at 1750 rpm, overruning the 100 rpm. speed of gear motor. For remaining 32 min. reclaiming period, power to horizontal motor is off and gear unit again drives machine.—*U. S. Electrical Motors Inc., Terminal Annex (Box 2058), Los Angeles 54.*

Circle 102C on Reader Service Card

Rotary Roof Cooler Is Easy to Install



Simplicity of installation marks this rotary cooler that sprays a film of water over roof to dissipate heat by evaporation. To install, roofing need not be disturbed, no special skill is required, no electricity is used.

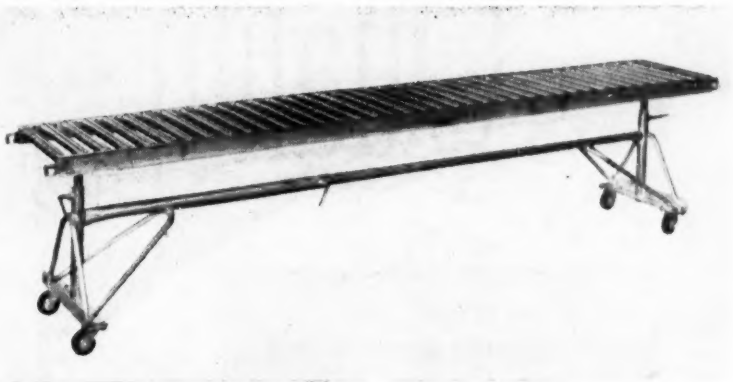
Device is claimed to reduce greatly indoor temperature, or where this is controlled, load on cooling machinery. In summer higher outdoor temperature sends undesired heat into a building, mostly through roof, sunshine raises roof temperature much more than that of any of side walls. Reducing roof temperature, therefore, is very effective.

Cooler is assembled on a standard brass coupling for attaching to a water pipe and consists of a nozzle and a water wheel. A jet of water shoots from nozzle over space to be cooled. It also sets wheel in motion which in turn rotates cooler to make it serve a large area, and divides water for intimate evaporative contact with air before it acts on roof.

Where horizontal runs of tubing are involved, cooler slides on its base plate to allow free expansion and contraction.—*Siegfried Ruppright, Box 6759, Los Angeles 22.*

Circle 103A on Reader Service Card

Portable Supporting Base Is Adjustable Vertically

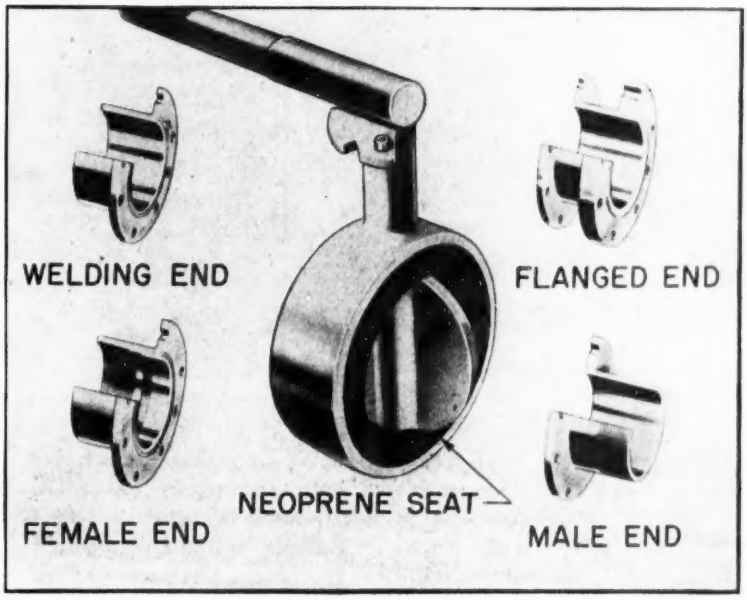


Ease in moving and vertical adjustment of straight sections of conveyor is provided by this portable base.

Support is adjustable in length at center tie to accommodate varying length sections from 5 to 10 ft. Support comes in three sizes, providing vertical adjustment to give conveyor elevations from 18 to 28 in., 24 to 40 in., 30 to 52 in. Base is furnished with four ball bearing swivel casters having 3 in. dia. hard rubber wheels.—*Standard Conveyor Co., North St. St. Paul 9.*

Circle 103B on Reader Service Card

New Type Valve Has Neoprene Seat



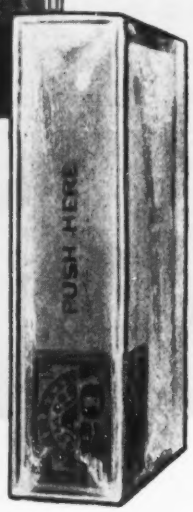
Flow of slurries and liquids containing suspended solids can be shut off completely with use of this new proved type of butterfly valve for low pressure and/or vacuum service, state manufacturers.

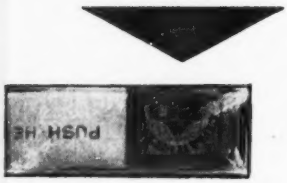
Key to new valve's versatility is its resilient neoprene seat. A resilient seal ring exerts positive pressure against butterfly disk when valve is closed. It is not subject to scoring by abrasive particles. If a bit of solid is caught between disk and seat, a resilient seat can deform around it and still maintain a tight seal.

Replaceable seat is firmly held inside a specially constructed ring that supports both ends of stem. Corrosion and leaks are prevented by a bronze bushing and a gasket seal at top of stem where it projects through ring casting. Disk can also be made of aluminum bronze or manganese bronze to resist corrosion.

Flanged end fittings are bolted together across contained rubber seat

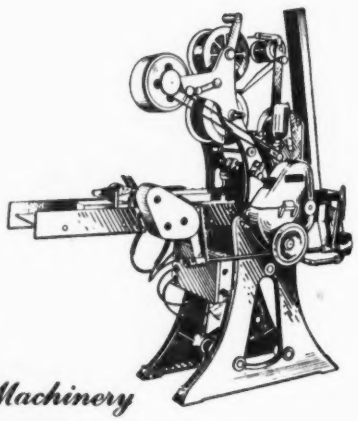
Quality DEMANDS Quality





WITH REVENUE STAMP ATTACHMENT

SCANDIA'S all rotary continuous motion means higher wrapping efficiency with lower maintenance costs. The compactness of design saves valuable floorspace. All types of special attachments are available, such as Opening-Tape Units, Automatic Intakes and Special Discharge Stackers, Electric Eye Registration Units, Booklet and Card Feeds, etc.



SCANDIA

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and outer ring support. This permits easy removal of valve for inspection or repair without breaking line. Valve handle is spring-loaded and locks securely in both open and closed positions.

Each size valve has a full hole opening and is self-cleaning. Disk is designed so that, in open position, there is full line flow with practically no resistance or turbulence. Construction is such that no grease is needed for ease of operation.

Among advantages offered by new valves is flexibility of installation. They can be mounted between standard flanges, and are available with various end fittings having screw ends (male or female), welding ends, or flanged ends.

Another advantage is light weight. Basic 4 in. valve weighs 13 lb.; complete with end connections it weighs 21 to 34 lb., depending on type of fitting used.

Valves were designed for operating pressures up to 140 psi., and are made in a complete range of sizes from 2 through 12 in.—*Keystone Tool Corp., 5324 Kirby Drive, P. O. Box 6716, Houston 5.*

Circle 103C on Reader Service Card

Compact Volumetric Feeder Handles Drys Accurately

Small quantities of dry materials such as vitamin concentrates and mineral supplements can be accurately handled by this new volumetric feeder.

Called the Vitamiser Volumetric, Model 50 disk feeder is compact, occupying only 14x21x20 in. of space. Low power requirements and simplicity of design result in economical operating and maintenance costs.

A uniform rate of feed is maintained by a 40w. synchronous motor driving the slow moving feed disk. Change in feed rates are obtained by a micrometer gate adjustment knob. An accuracy of 3 percent by weight over a 20 to 1 range is obtained by a large feeding orifice and gate adjustment calibrated to thousandths of an inch.

Improved flat disc feeding mechanism features a controlled angle of repose of material which assures uniform, volumetric feeding regardless of changing flow characteristics of chemical. Feeding orifice is stated not easily clogged or changed in capacity by accretion.

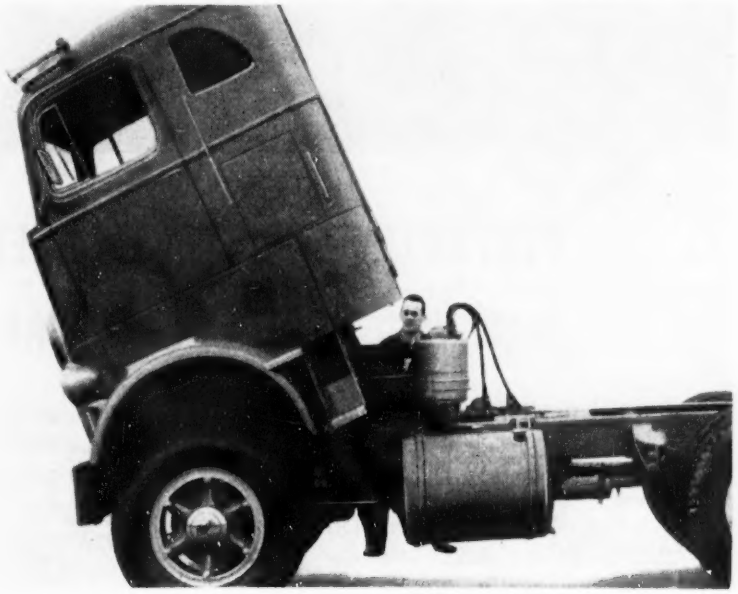
A small lamp illuminates both feeding compartment and adjustment scale while feeder is operating, allowing a full view of operation through a transparent door.

Platform scales can be furnished with feeder to check actual weight-loss of material being fed, and to eliminate need of catching samples.

Model 50 can be easily arranged to feed automatically in proportion to output of a primary pacer in a continuous process system.—*Omega Machine Co., 345 Harris Ave., Providence, R. I.*

Circle 105A on Reader Service Card

New Cab-Over-Engine Tractors for Maximum Payloads



Increased payload weights within state gross weight tractor-trailer limitations are claimed with use of two new cab-over-engine tractors. New design transfers more weight to underloaded front axle.

Other features reported are: Manually-tilted cab; choice of gasoline or diesel powerplants; a wide range of gearset and rear axle ratios and tractor with 35 ft. trailer fits within an overall length of 45 ft.

New tractors differ from maker's conventional units in appearance in height of cab top above ground. To provide a flat floor, clear from side to side without obstruction except for gearshift levers, necessitated placing floor entirely above engine.

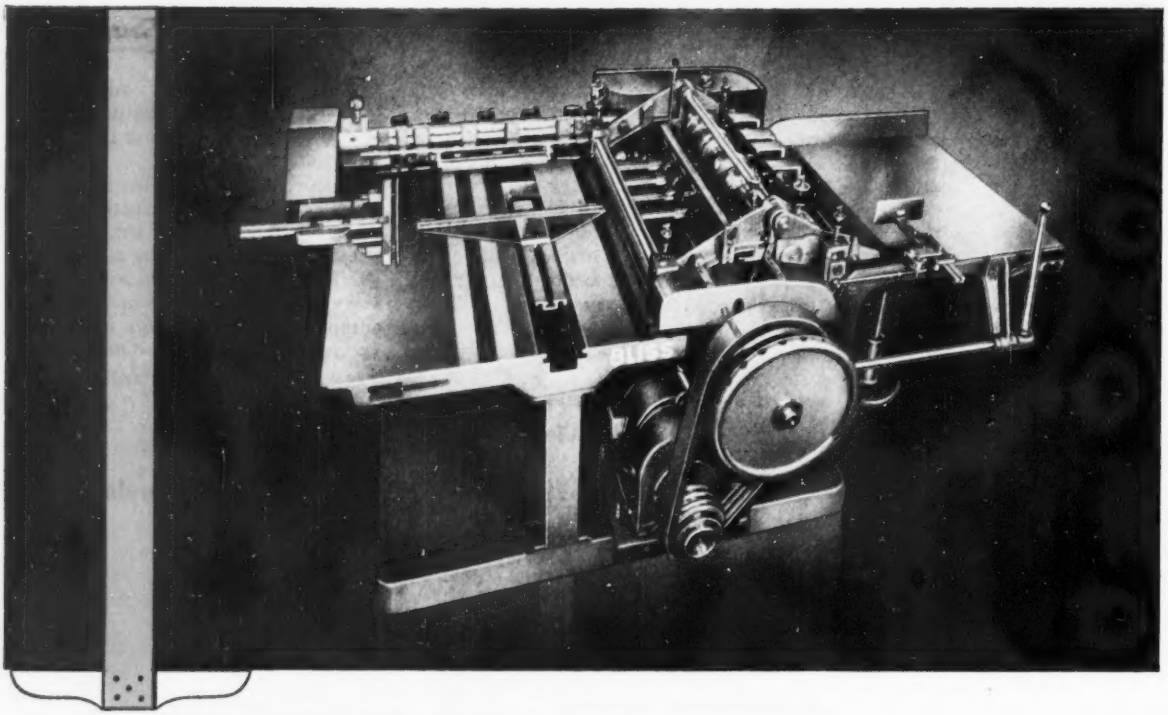
With an adjustable driver's seat for maximum comfort, cab is wide enough to seat three men, two on a second rider's seat. Behind seats is a ventilated sleeper compartment with space for a mattress in accord with ICC regulations.

Other cab features include a large-area windshield and door windows. These, in conjunction with floor above engine, provide a cab of superior road vision with driver's eye level well above roadway headlight glare zone.

Still other cab features include a demountable instrument panel for quick access to connections as well as attachment of fenders and skirting directly to cab so they move with it when tilted.

Without sacrifice of strength or durability, use of lighter metals in chassis construction is said to reduce weight of new tractors by 1,000 lb.

New tractors differ only in their respective powerplants. Model H60T has a Thermodyne gasoline engine developing 170 hp. at 2,800 rpm. while Model H61T has a Thermodyne diesel engine of 170 hp. at 2100 r.p.m. If



PERFECTLY REGISTERED SHEETS
begin with PERFECTLY SQUARED SHEETS

...and the Bliss Duplex Squaring Slitter is your answer to perfect squaring...

When you begin with micrometer tolerances there's seldom a chance of spoiled litho sheets through poor register. And the unusually accurate gaging possible with the Bliss Slitter starts you off with perfectly squared sheets.

That means that right down the line—in all your production operations—you can hold far finer tolerances. You eliminate "multiplying" errors; you eliminate spoiled sheets.

You can also use the Bliss Slitter to cut body blanks: trim the sheets in the first operation and slit the sheet into strips or large blanks on the second operation table.

And remember: the Duplex Squaring Slitter, like the other labor and time-saving equipment in the Bliss line, is designed and built by one of the oldest firms in the can and container field.

Bliss engineers will be glad to help you work out your production problems. No obligation, of course. Meanwhile, to learn more about the Duplex Slitter and other Bliss machines, write today for Catalog 36-A.

E. W. BLISS COMPANY,
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New York 7, New York

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BLISS CAN AND CONTAINER MAKING MACHINERY

SLITTERS

BODYMAKERS

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SEAMERS

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still greater horsepower is required, Model H61T can be furnished with a Cummins NHB diesel as an option. —*Mack Trucks, Inc., 350 Fifth Ave., New York 1.*

Circle 105B on Reader Service Card

Steam Trap's Connections Are on Opposite Sides

This new No. 814, side inlet-side outlet, steam trap with 1 in. or 1¼ in. threaded connections is offered to meet demand for larger pipes with horizontal opposite pipe connections.

Body and cap are cast semi-steel, valve and seat are hardened chrome steel and interior trim is stainless steel.

Pressures range from 0 to 250 psi.; capacities, up to 6,800 lb. per hr. depending on pressure. Height is 13⅜ in.; dia., 9 in., weight 45 lb.—*Armstrong Machine Works, Three Rivers, Mich.*

Circle 107A on Reader Service Card

Compact Fork Lift Trucks For Crowded Quarters

Durability, maneuverability and compactness are features claimed for two completely new fork lift trucks in capacities of 3,000 and 4,000 lb.

They are the Models YC-40 and UC-30, powered by heavy-duty, water-cooled industrial engines and mounted on cushion-type tires.

Safety, operator comfort and ease of operation are "built in" the new trucks, according to maker.

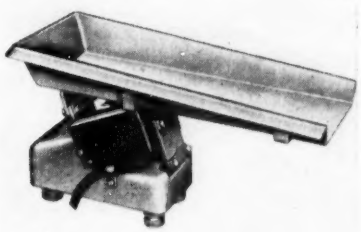
YC-40 has a capacity of 4,000 lb. at 24-in. load centers. Its narrow width of 38 in. and short overall length of 78½ in. permit it to operate with speed and efficiency inside of boxcars and in crowded quarters. Its low, collapsed height, 82¼ in. permits it to pass through ordinary doors and under low ceilings. Load can be raised 30 in. before minimum height is affected. Ample underclearance allows safe travel over rough surfaces and inclines. Unit will climb a 20 percent grade loaded or empty.

UC-30 is basically same truck but with 600 lb. less counterweight and a capacity of 3,000 lb. at 24-in. load centers. Overall length is 74⅜ in. and it will climb a 24 percent grade loaded or empty.

Both trucks have a sharp turning radius of 75 in. and 30 in. of free lift on standard 9 ft. uprights. Other features include heavy duty brakes, simplified automotive-type controls, quick-change clutches and readily accessible service points.—*Hyster Co., Portland 8, Ore.*

Circle 107B on Reader Service Card

Small Vibratory Feeder Handles Bulk Materials



Efficient handling of low tonnage bulk materials is now offered with use of new small, electromagnetic vibratory feeder, Model F-01.

Unit illustrated has a maximum feeding capacity of 2 tons per hr. and was designed to handle those intermediary applications ranging between one and two tons per hour.

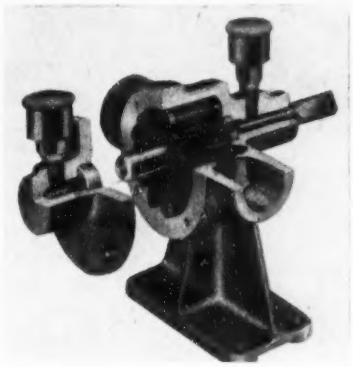
Electromagnetic design eliminates use of any rotating, working parts such as gears, cams, belts, chains. All action is confined to easily replaceable leaf springs.

Regulation of material flow out of unit is governed by a rheostat in feeder's controller. Flow rate may be altered by turning rheostat knob.

New model weighs 48 lb. and is furnished complete with its own controller, ready for installation.—*Syntron Co., Hower City, Pa.*

Circle 107C on Reader Service Card

Multi-Vane Impeller Ups Pump Efficiency



Improved priming qualities and increased pump output with same power are features claimed with use of new impeller design.

New impeller, moulded in a tough, durable rubber, has 12 vanes which result in greater displacement and greatly improved pump priming. Sharp lateral wiping edges on each vane are stated to minimize friction by reducing impeller drag, produce less unit wear and improve mechanical efficiency of pump up to 15 percent. Another advantage claimed for multi-vane impeller is even, continuous flow.

Pump is available in three models —½, ¾ and 1 in. port sizes. Pump case bronze, other features include a stainless steel shaft, replaceable unit-type seals and straight-through ports. —*Hydro Engineering, Inc., 404 No. Washington Ave., Minneapolis 1.*

Circle 107D on Reader Service Card

Want more information?

It's free—and easy to get. Simply note here the items on which you want more details, then circle each key number (there's one given at the bottom of each item) on the handy Reader Service postcard—page 159. Then sign at the bottom and mail.

For your convenience, too, items in this department are listed and keyed in the Reader Service Section.

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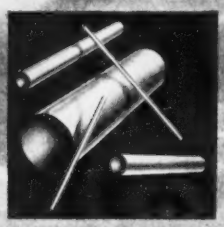
with TRENTWELD

Here's proof of the dependability of TRENTWELD stainless steel tubing — its use in hydraulic lines in the Boeing "Flying Boom" system of mid-air refueling. TRENTWELD tubing is flying in such other vital places as heaters and jet engines in many different military and civilian aircraft.

It takes tube mill specialists to produce tubing that conforms to such rigid quality standards . . . and that's where the Trent Tube Company excels. Our entire operation is devoted to the production of quality tubing in practically any size from ⅛" up. Through our exclusive fusion-welded process we can provide you with finished tubing in which the weld is equal or superior to the tube body in terms of strength and heat and corrosion resistant properties. And dimensionally the tube is completely uniform throughout.



Your application may be a far cry from mid-air refueling, but Trent engineers are well experienced in solving tubing problems for many diversified uses. Let a specialist help you with your problem by calling in one of our representatives. *You can't buy better tubing than* TRENTWELD.

TRENTWELD

STAINLESS STEEL TUBING

TRENT TUBE COMPANY, GENERAL SALES OFFICES, EAST TROY, WISCONSIN (Subsidiary of CRUCIBLE STEEL COMPANY OF AMERICA)

New Bulk-Food Container Offers Many Advantages

Major advantages claimed for a new, bulk-packaging type food container are: Moistureproof construction, faster freezing and thawing of food, quick removal or replacement of barrel heads without contamination or splinters, increased capacity because of straight sides, and high resale value.

Container is a 55 gal. sanitary, steel drum featuring lining of saran film—successful packaging material for such items as processed meats, sausage, cheese, baked goods and dried fruit. Transparent film provides a tough, moisture-resistant, insert-lining bonded to inside surface of barrel.

Lamination is accomplished by first applying a special bonding coat to steel and then film is added to form a smooth, sanitary surface. Barrel heads are lined in same manner.—*Rheem Mfg. Co., 570 Lexington Ave., New York 22.*

Circle 109A on Reader Service Card

Conveyor Guide Rails Have Teflon Surfaces

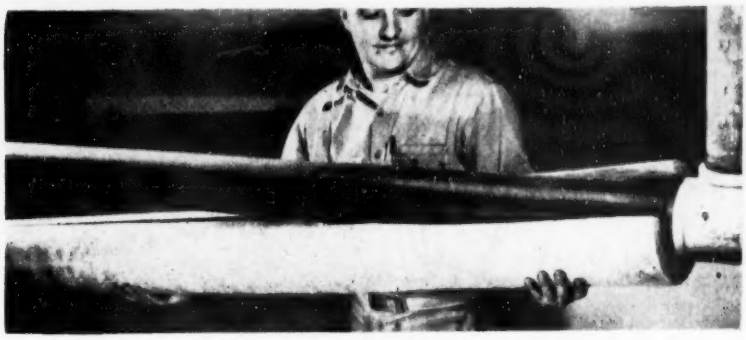
Development of a method of cementing slippery Teflon to steel plate, equipped with studs for attaching to conveyors is said to solve problem of products damaged and packages marred by guide rails.

Teflon surface is slipperiest plastic known to science. Plastic is also chemically and biologically inert, tasteless, odorless, non-contaminating, and long wearing. Guide rails are available in any desired width.

Teflon surface is $\frac{1}{8}$ in. thick. Steel backing plate is $\frac{1}{8}$ in. or thicker depending on requirements. Size of studs and their location are in accordance with customers specifications. A template or drawing is required.—*United States Gasket Co., Camden, 1, N. J.*

Circle 109B on Reader Service Card

Glass-Fiber Pipe Insulation Goes on Easy



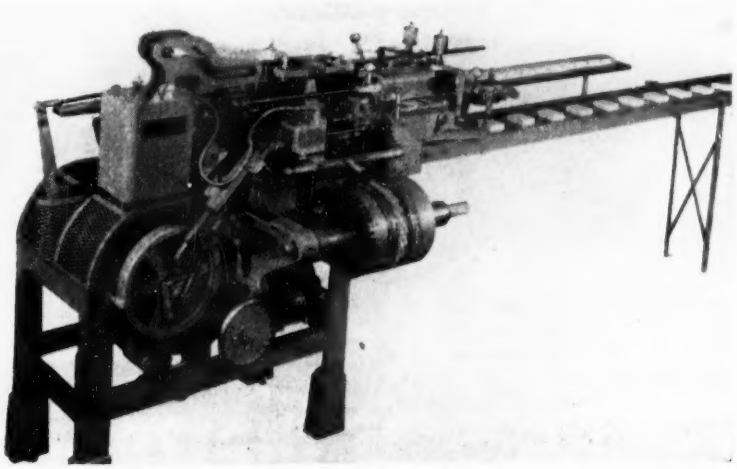
Fast, easy installation and high thermal efficiency are among many advantages claimed for new, one-piece molded, glass-fiber pipe insulation.

Called Ultrafine pipe insulation, it is composed of fine, blown glass fibers bonded with a phenolic resin and molded into one-piece sections. It is reported as resisting rot, mold, decay or moisture, as well as attack of most acids and alkalis. Material is recommended for low temperature applications and heated pipe applications up to 350 deg. F. A second layer can be employed on higher temperatures.

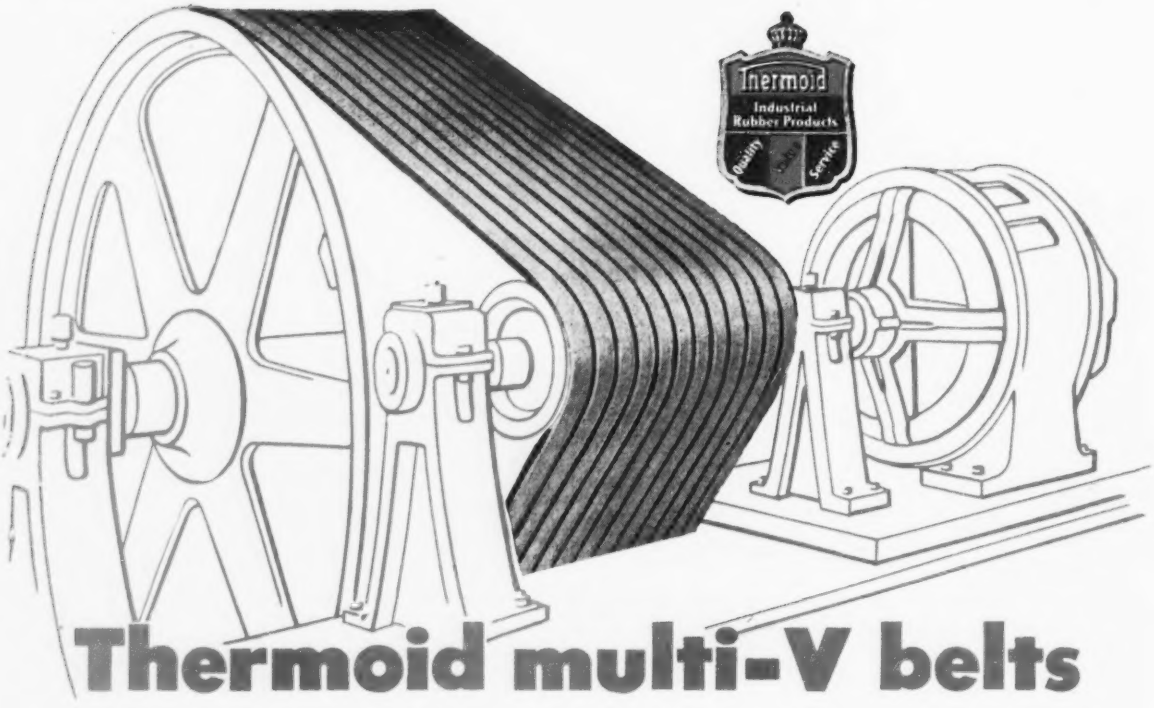
Other features claimed are: Light weight permits 6 ft. lengths to be readily handled. It can be easily spread at seam to slip over pipe, and quickly snaps back into original cylindrical shape when applied over pipe. New insulation is reported not to break, powder or crumble, or bend out of shape. It does not become soft or muddy in contact with water and can be readily cut with an ordinary knife.—*Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo.*

Circle 109C on Reader Service Card

Overwrap Unit Provides Longer Shelf-Life



New help in extending shelf-life of candy is offered by a recent development, the "V-Type" underfold. New overwrap can be incorporated into maker's regular wrapping machine, and is stated to provide a moisture-



Thermoid multi-V belts

pre-stretched for non-slip performance

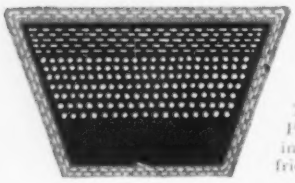
When you use Thermoid *Pre-stretched* Multi-V Belts, you can be sure of maximum power transmission, economical non-slip performance and extra long belt life.

Thermoid Multi-V Belts withstand moisture, abrasion and repeated shock loads.

They're built to take it—specially designed to resist internal friction and heat.

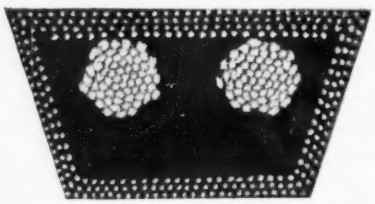
Your Thermoid Distributor can help you with power transmission problems, whether you use Multi-V, F.H.P. or Flat Transmission Belts.

It pays to specify Thermoid.



Thermoid D and E Sections Grommet type construction assures lower permanent stretch, greater flexing ability and shock absorption.

Thermoid A, B and C Sections Plied cord construction, latex impregnated to reduce internal friction and heat build up.



Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

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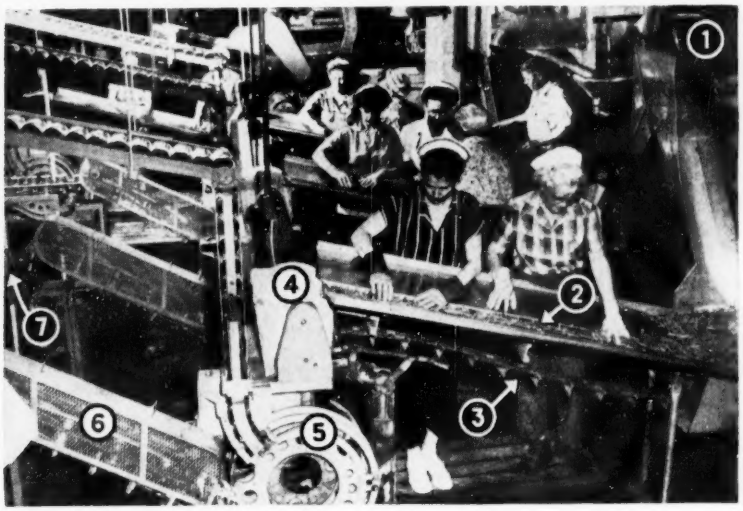
proof and airtight seal which helps preserve freshness, flavor and appearance of candy.

Machine wraps 25 or more packages per min. with one attendant. It handles a wide variety of shapes and sizes including extended-edge candy boxes and produces a neat wrap. Machine, fully automatic, easily handles and heat-seals cellophane, foil, wax paper, pliofilm and other types of wrapping material.

If wrapper is printed, electric eye registers message at right location on package. Special attachments such as roll-type labelers and imprinters are available. *Hayssen Mfg. Co., Cheboygan, Mich.*

Circle 109D on Reader Service Card

Automatic Unit Fills Beans Into Cans



Both whole and cut green beans are stated filled automatically into cans with this Carruthers Multi-Pak Green Bean Filler.

Beans from blancher (1) are fed to filling basin (2). A continuous chain, (3) partitioned into 28 sections or baskets holding the approximate volume of beans required to fill a 303 can, moves through basin. Any baskets not completely filled are replenished manually. Filled baskets automatically dumped into hopper (4) from which a dump-valve drops each separate basket-full into a forming pocket.

There are three forming pockets in a revolving turret. Each pocket has an individual plunger, operating on horizontal plane. As turret revolves, pockets close about beans, gently compressing them to can size. Dump valves, forming pockets and plungers, are actuated by combination of positive cams and springs.

Empty cans are fed from can-run into another revolving turret (5), synchronized with pocket turret. Plungers eject beans from forming pockets into indexed empty cans in the unit.

Filled cans are then turned 90 deg (6) from horizontal to upright position in a can elevator and then, on a conveyer (7), move to brining and can-seaming stations.

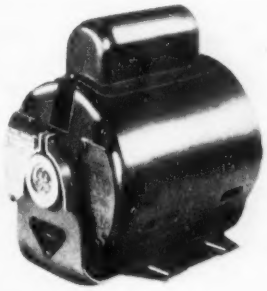
Filling basin, buckets, hopper and dump valve are all of stainless steel. Forming pockets are of hard chrome-plated brass castings and plunger heads of chrome plated steel. All machine parts coming in contact with product are of stainless or hard chrome plated surfaces assuring maximum sanitation.

By variable speed motor drive, filler can be adjusted to operate between speeds of 25-100 cans a min. Sixty cans seems most efficient speed. From experience gained in present installations it is estimated that average machine will displace 20 operators hand-filling.

Specifications: Filling basin is 7 ft. long and 2 ft. wide. Channel through which bucket chain passes in center of basin is 5 in. wide. Overall length of unit 8 ft. 4 in. Overall width at motor section 4 ft. 6 in. Height from floor to top of hopper 4 ft. Weight 2,700 lb. approx.—*Western Filler Co P. O. Box 1332, Warrenton, Ore.*

Circle 111A on Reader Service Card

Small Motors Start On High Torque



New, special-service, fractional-hp. motors for applications requiring moderately high starting torque, have been announced.

Rated at ½ and ¾ hp. 1725 rpm., new motors can be mounted in any position, and are easily reconnectable at terminal board for 115 or 230v. They are smaller and lighter in weight than corresponding general-purpose ratings, according to maker's engineers.

Starting currents conform to NEMA standards.—*General Electric, Schenectady 5, N. Y.*

Circle 111B on Reader Service Card

Speeds Maintenance In Larger Plants

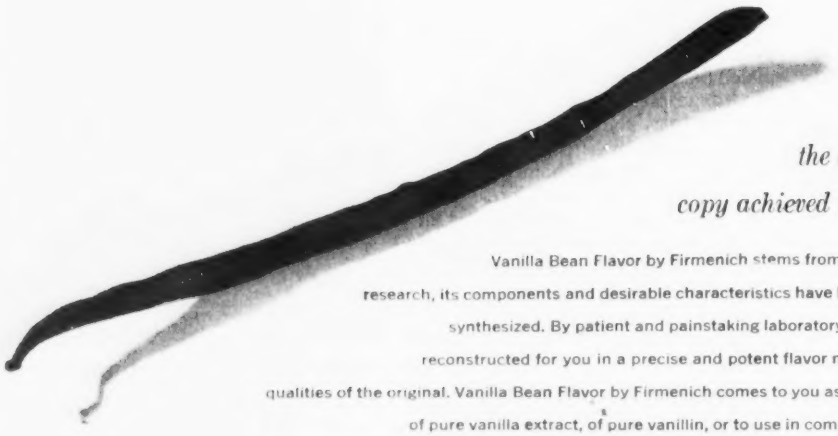
Fast, economical maintenance in larger plants where speed is a "must," is claimed for this new 22 in. all purpose floor machine, the MC-22 (foreground).

Machine is powered by a special G.E. 1½ hp. motor. Portable unit is termed ideal for floor areas of 20,000 sq. ft. or more. With addition of MC-22 to line, maker now features six machine sizes to handle floor areas

CONTAINS NO COUMARIN

STRONGER THAN VANILLIN

imitation vanilla bean flavor by Firmenich



the direct and authentic
copy achieved by original research

Vanilla Bean Flavor by Firmenich stems from the vanilla bean. By original research, its components and desirable characteristics have been isolated, identified, and synthesized. By patient and painstaking laboratory techniques, they have been reconstructed for you in a precise and potent flavor material with all the aromatic qualities of the original. Vanilla Bean Flavor by Firmenich comes to you as an economical replacement of pure vanilla extract, of pure vanillin, or to use in combination, in the manufacture of all products that you flavor with this most popular of flavors.

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250 WEST 18TH STREET • NEW YORK 11
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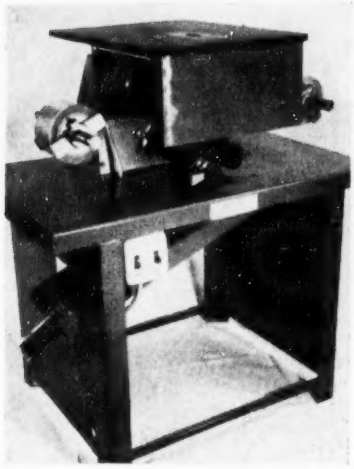
ranging in size from 750 to over 20,000 sq. ft.

For maximum economy and efficiency, maker points out that selection of proper size machine with respect to floor area to be covered is essential. For guidance, here is data on machine size and area handled, respectively: 12 in., 750-2,000 sq. ft.; 14 in. 2,000-5,000 sq. ft.; 16 in., 5,000-10,000 sq. ft.; 19 in., 10,000-20,000 sq. ft.; 22 in., 20,000 sq. ft. and over.—*Multi-Clean Products, Inc., 2277 Ford Parkway, St. Paul 1.*

Circle 111C on Reader Service Card

Package Size Adjustable On Automatic Machine



Change-over to different size packages is said easily made on this versatile Auto-Pak machine.

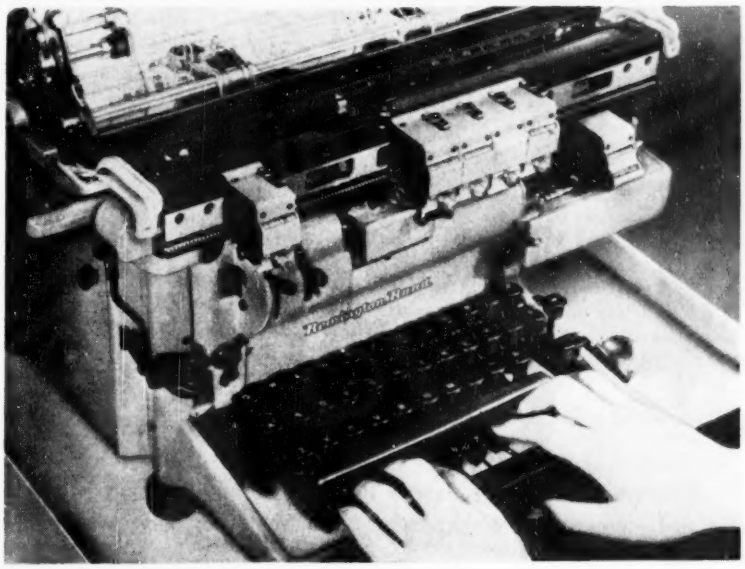
Unit automatically forms two sheets of heat sealing material around products, seals four sides, cuts off and delivers completely sealed package. Unit, which plugs into any ordinary light circuit, makes packages from 1 in. sq. by ¼ in. thick to 6 in. sq. from practically any heat sealing web including cellophane, foil, glassine, heat sealing kraft.

Attachments, including belt, turret, hopper and other units are available for automatic feeding. Speed is up to 40 packages per minute when products are hand fed. Automatic and semi-automatic feeding increases production and eliminates operator error.

Machine is 2 ft. wide, 3 ft. long, 3 ft. high and weighs 500 lb. A ¼ hp. motor supplies power and accurate thermostatic control of heat is provided.—*Pak-Rapid Inc., 530 N. 21st St., Philadelphia 30.*

Circle 113A on Reader Service Card

New Machine Provides Mechanized Accounting



Simplicity and flexibility highlight this new low-cost bookkeeping machine which is said to provide completely mechanized accounting, including full description of entries.

Delivered with typewriter keyboard and a minimum of five registers, unit is practical for smallest potential user while expandable to needs of largest, through simple modification.

In terms of simplicity, unit has been kept uncomplicated so it may be operated by a clerk with limited bookkeeping knowledge. Indicative of its flexibility is ease and speed in changing from one type of bookkeeping job to another.

Unit is not merely a posting machine, but a complete bookkeeping machine producing records with full description and mechanical proof for every entry, instantly computed account balances, and automatically accumulated accounting control figures.

Entire range of bookkeeping applications can be turned out, including accounts receivable, accounts payable, payroll, general ledger, sales analysis, cost distribution, and invoices.

Along with high-speed figure mechanism, touch-operated alphaebtic keyboard permits every item to be described as fully as is needed on every record. Descriptions, which can be typed anywhere on form, facilitate reference and prevent misinterpretations. Unusual entries can be clarified. Time savings can be effected by heading up forms during a posting run, when required for a new account or an overflow of entries on statement or ledger. Journal entries can be identified by account name, which is especially important for cash items and also expedites auditing of books.

A large, clean type face has been provided for neat, readable entries on both originals and carbons. In addition to 26-key alphabet and 10-key numeral sequence, keyboard contains nine character keys to round out descriptions.

All computations are made automatically and step by step within registers. Cross register, which computes new account balance, will lock automatically if balance is transcribed incorrectly. Vertical register, which computes column totals, will also lock if an entry is not made in its correct decimal position.

A single control key permits red-ribbon printing of any credit balance, together with a CR proof symbol on all carbon records to indicate nature of the balance. Same one-key method is used for red ribbon contra-entry in any column to adjust an account or correct an error, with automatic reversal of amount in each affected register. This method of obtaining true net amounts in all account balances and column totals is made possible by direct subtraction in all registers.

All controls are simplified and within easy reach. Touch of a key tabulates carriage into entry position for each column while one stroke of date key prints day, month, and year of entry. Still another key controls both electrified return of carriage and simultaneous line-spacing of journal for next item. And since cross or

Satisfaction rests on the carton

Dealer good-will is vital in the highly competitive beer industry. Pabst Brewing Co., brewer of one of America's great beers, does an outstanding merchandising job with retailers, also makes sure that Pabst "Blue Ribbon" reaches the sales floor looking as good as it tastes. Pabst, like many other famous brand names, is protected in shipment by UNION Corrugated Containers.

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Western Division Sales Offices: 4545 West Palmer, Chicago 39, Ill. • Executive Offices: Woolworth Bldg., New York 7, N. Y.

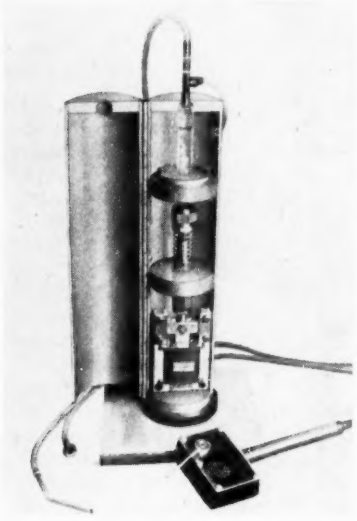
For more information, use coupon on page 159.

vertical registers lock automatically in event of error, operator knows without looking that entries have been made in correct decimal position and new balances have been posted correctly.

Keyboard has light touch of a standard typewriter.—*Remington Rand Inc., 315 Fourth Ave., New York City 10.*

Circle 113B on Reader Service Card

Automatic Dispenser For Small Quantities



Addition of small volumes of liquids —flavoring materials, solutions of monosodium glutamate, calcium salts —is reported quickly and accurately handled by this fully automatic dispenser, the Micro-Portioner.

It operates as follows: Specially designed switch is placed in line of travel of container on a conveyor. When container trips switch, a measured amount of liquid is drawn into syringe of unit, due to solenoid becoming energized. As soon as container has passed switch, solenoid becomes de-energized, and a spring forces measured amount of liquid into container from a delivery tip which is located directly above moving container. In this way container never stops moving on conveyor. No container—no fill.

Volume of delivery is easily varied by turning lower hex nut. Velocity of ejection is controlled by turning upper brass hex nut. Volume range is 0 to 4 cc. Speed range is up to 150 containers per min. for short stroke, less for larger stroke.

Average error of measured volumes is less than 1 percent. Unit weighs 11½ lb.; Dimensions are: 3½ in. dia., 16 in. high.—*Kaufman Laboratories, 2833 Westminster Court, Louisville.*

Circle 115A on Reader Service Card

Lab Mixer Duplicates Production Results

New mixer provides laboratories and pilot plants with a small working duplication of production mixing so they may establish standards or check quality and efficiency. New laboratory size Simpson "LF" has a 24 in. pan dia., and all components—mullers, turrets, crib, as well as batch capacity—are in a direct proportionate scale to large production-size units.

Rubbing, kneading, smearing action of mortar and pestle is said to be duplicated by revolving mullers and plows. Spring-loaded mullers can be adjusted to exert pressures from 30 to 80 lb. to meet a wide range of laboratory mixing requirements. Unit may be easily adapted for heating or cooling while mixing—and can be furnished in stainless or other special metals.

Adjustable legs on unit allow individual to adjust to a comfortable working height. New mixer is provided with a V-belt drive for flexible operation, a new funnel that directs liquid additions directly to material bed, and a new, leakproof circular discharge door to provide quick discharge of batch.—*National Engineering Co., 622 Machinery Hall Bldg., Chicago 6.*

Circle 115B on Reader Service Card

Steam Unit Peels 3 Tons Of Spuds Per Hour

Rated capacity of a new potato peeling machine, capable of steaming and stripping the skins, is 3 tons per hr. Here's how it works:

First, potatoes are steam-treated in a stainless steel container under a pressure of 100 psi. Then, when steam softens potato surface, spuds are emptied onto a conveyor and run over rubber-coated rollers which rub off loosened skin.

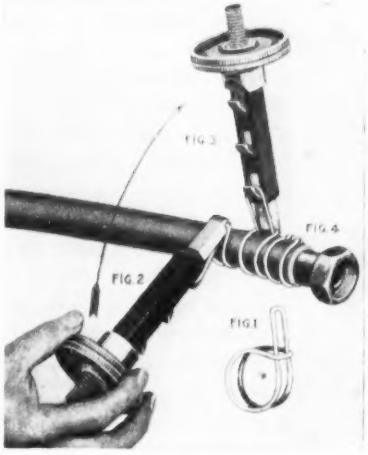
Jets of water play over potatoes to complete removal of peels and eyes. Like skin, eyes come loose in steaming process.

Skinless potatoes are dropped into a hopper at end of peeling operation, which takes only 3 min.

Machines are designed for use by potato canners and producers of specialties, such as frozen varieties, including shoe string, french fries and sweets.—*Pfaudler Co., Rochester, N. Y.*

Circle 115C on Reader Service Card

This Wire-Band Applier Speeds Hose Hook-Ups



Fast and easy hose connections are reported with use of this wire band and tool combination.

Tools are made in two sizes to fit hose: Junior for bands up to ¾ in.; Senior for bands 1 in. and over. Bands are made of soft steel wire, electro galvanized and welded. They are also made in brass if required. They are available for hose from ¼ to 3 in. in dia.

Bands are stated to give tight, permanent and rust-proof connection. They can be used equally well for air, steam, water, or oil hoses. Bands make a small joint, with no shoulder to catch or foul when moving hose from place to place. Only a small stock of sizes need be carried as same band will fit hose of many different plies.—*Squire-Cogswell Co., 4140 N. Kedzie Ave., Chicago 18.*

Circle 115D on Reader Service Card

TEN REASONS WHY...

TYGON TUBING IS A BETTER PIPING MEDIUM IN FOOD PROCESSING

Here are ten reasons why you should use TYGON TUBING to transmit fluid foods, or beverages, in your plant:

1. **TYGON TUBING** is glass clear—provides full solution visibility — permits close flow control.
2. **TYGON TUBING** is fully flexible — fits the most intricate piping layout — requires the minimum of fittings.
3. **TYGON TUBING** is mirror smooth — makes cleaning easy, fast, and thorough.
4. **TYGON TUBING** is non-toxic — is fully approved by leading health and food authorities.
5. **TYGON TUBING** is non-contaminating—handles even milk with complete safety.
6. **TYGON TUBING** is steam sterilizable — assures completely sanitary conditions.
7. **TYGON TUBING** is lightweight, strong and abrasion resistant — makes the perfect portable hose.
8. **TYGON TUBING** is non-oxidizing—just lasts and lasts and lasts.
9. **TYGON TUBING** is made in a full range of sizes (up to 2" ID) — meets any piping demand.
10. **TYGON TUBING** is also available with braided jacket reinforcement—fabric, plastic or stainless steel braid permits use in high pressure applications.

TYGON flexible plastic TUBING

Why don't you try TYGON TUBING? See for yourself how TYGON TUBING can handle your food transmission problems . . . efficiently and economically.

WRITE TODAY

Ask for Bulletin T-77.

Address: The U. S. Stoneware Co., Akron 9, Ohio
Plastics and Synthetics Division

287c

Third Wheel on Truck Eases Handling Tasks

Carting and wheeling of heaviest loads is claimed eased by addition of third wheel to this new magnesium hand truck. Third wheel is fully retractable.

When wheel is extended, truck can be operated in a three-point position, preventing any load from bearing on operator. Similarly, when truck is stopped in this position, it can be restarted without physical effort normally needed to overcome dead load-weight. For conventional use, third wheel retracts snugly against frame.

New model is of all-magnesium construction, and combines lightness and ease of handling with structural strength. Nose extends beyond wheels on either side, preventing flexible loads from binding against wheels.—*Magline Inc., Pinconning, Mich.*

Circle 117A on Reader Service Card

New Chemicals

Bread Pan Cleaner Does Speedy Job

Faster cleaning of bread pans by soak tank or washing machine methods is claimed for a new pan cleaner, Composition No. 42.

Material is said to be especially effective for safe cleaning of tinned pans incorporating aluminized steel straps and spacers, and may also be employed for cleaning sweet goods pans and trays in spray washing machines and pie tins in tumbler washers.

When subjected to a standard bakery test, manufacturers state, materials showed no weight loss of tin coating in grams per sq. in. carried out to four decimal points. Material is reported to work equally well in tanks or washing machines.

In tanks, concentrations may range from 1 to 4 oz. per gal. at temperatures of 180 F. to 212 deg. F. In machines, concentration may range from ¼ to ½ oz. per gal. at 140 F. to 160 deg. F. Material is said to be completely soluble in warm or hot water, does not foam excessively and rinses freely.—*Oakite Products, Inc., 126G Rector St., New York 6.*

Circle 117B on Reader Service Card

Compact Instrument Gives Fast Check on Fumigant

Quick, convenient testing of immediate atmosphere for hydrocyanic acid gas is claimed with use of new instrument which protects personnel against unnecessary exposure to toxic concentrations of HCN in fumigation of granaries, warehouses, and other applications. Operator equipped with unit is seen above.

A quick reading is easily made by squeezing aspirator bulb three times to draw in an adequate air sample. Any HCN present turns white granules of reagent in detector tube blue, beginning at end where air sample enters. Length of travel of this coloration increases with percentage of gas in air. Concentrations from 0 to 50 ppm. may be read on graduated scale of detector tube.

A durable leather kit with shoulder strap contains everything necessary for making 12 separate tests. In addition to detector, kit contains a tube rack, mixing bottle, mandrel, color scale, 12 glass tubes with rubber caps, two vials of granular reagent, and glass-cloth swatches. Twelve tubes can be filled at one time and stored one week at temperatures of 90 deg. F.; for two to three weeks at 70, and two months at 40 without loss of sensitivity.—*Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8.*

Circle 117C on Reader Service Card

Odorless, Non-Toxic Finish Available in Many Colors

A new line of finishes, named Steelast is now available in black, white, gray, ivory, green, red, orange and yellow colors. Formula for new products is basically the same as that of stainless steel coating in that both use a vinyl plastic vehicle. Change of pigment makes colors possible.

Film produced is stated to be impervious to moisture, resistant to most chemicals, odorless and non-toxic when dry.

Material can be sprayed, brushed or dipped and will withstand constant wet heat up to 180 deg. F. and constant dry heat up to 300 deg. F. Dries to handle in 30-60 min. after spraying. 2-3 hr. for recoating.

It can be applied to rusted or bare unrusted metal after surface has been treated, or over painted surfaces that show positive after pretest with primer. Up to 600 sq. ft. covered by 1 gal.—*Steelcote Mfg. Co., 3418 Gratiot St., St. Louis 3.*

Circle 117D on Reader Service Card

New Perfume Bases Offered For Scenting Detergents

Recently developed is a new line of perfume bases, designed specifically for scenting liquid and powder detergents.

Christened Deteromes, new odorants withstand high temperatures of manufacturing processes and mask odor of petroleum base most frequently used in synthetic detergents. Available in many different fragrances, bases should be used in following proportions: Liquid, from ⅛ to ¼ oz. per gal.; powder, from ¼ to ½ percent.—*Dodge & Olcott, Inc., 180 Varick St., New York.*

Circle 117E on Reader Service Card

OTHER DEPARTMENTS

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In Behalf of Progress . . .

Food Research Becomes Goat of Defense Economy

It is very disturbing to learn that a budget cut in the Defense Department will eliminate, or nearly so, the outside research of the Quartermaster Corps.

This sad bit of news came out at the recent 6th Annual Meeting, in Washington, of the Research & Development Associates of the Food & Container Institute.

Progress in solving the problems of feeding the armed forces receives a serious blow from this development—progress which also would contribute significantly to peacetime food processing.

Some three score outside research projects have been placed with universities and other institutions. Which indicates the magnitude of the work involved.

Typical of progress to be scrapped is research which is nearing successful conclusion on the dehydration of peas and corn. Dehydration, incidentally, is in many ways an ideal method of food preservation. Weight and bulk of the food are greatly reduced, no refrigeration is required for storage, the food can be put into large packages, and containers are relatively inexpensive. Just what the armed forces need, especially for overseas troops.

Economy in government expenditure is, of course, desired—in fact it was "ordered" by the election. And perhaps no complaint would be justified if the QMC research budget were cut only in proportion to the Defense Department's overall reduction. But the cut is going so far beyond that as to make research the goat.

Could it be that Defense Secretary Wilson—a most capable and conscientious executive—does not understand or appreciate the importance of basic research on food? He has been quoted as stating that he "is not interested, as a military project, in why potatoes turn brown when they are fried."

But soldiers are very much interested when their food doesn't taste right, or look appetizing. And they are more than a little concerned when shortage of shipping gives them a choice between bulky food and vital ammunition.

But come to think of it, practically no one outside the food industry understands its problems. So one would not expect the Secretary to be an exception. Therefore it is up to people in the industry to explain the situation to him and to his advisers.

Only enlightment disseminating from technical food men can steer government food research in the right direction.

Prepare to Raise Wages, Recession or Not

If there ever was any question as to whether the cost of labor would level off, or decline, it has been answered.

Despite its escalator clause and the prospect that it would hold wage rates steady or even pull them down in a recession, General Motors found it advisable to grant an increase which sets a new wage pattern.

Among other things, this pattern accepts as a permanent fixture the present level of prices and industrial costs. And it concedes to production workers in increased wages as much and probably more than the automobile industry seems to have any chance of saving through increased output per man-hour.

The steel industry, another pace-setter, also has increased wages appreciably. And in the food field, Eastern breweries gave production workers another 17.5c. an hour for a new day-shift rate of $2.65.

So as Number 1 on your list of management worries, put higher wages and the means for increasing productivity to offset them. In the food manufacturing field the profit margin is too small to comfortably absorb the coming boost.

And the date of the increase is made more imminent by improvement in profits of food companies.

In the first quarter of this year, earnings of a sample of 38 food firms in various branches of the industry were better than in the same period of 1952 by 21 percent. The only sad note was a decline of 24 percent in the profits of four grain products firms—not included, incidentally, in the 38 companies mentioned previously.

Food manufacturers know that the profit margin still is too thin to finance research and modernization at safe levels.

But labor unions won't let this deter them.

Even a recession would not hold labor in check, because union leaders will argue that only higher pay to give more buying power will correct a decline.

And speaking of recessions, our economics department would not be surprised to see some decline in industrial production, perhaps as much as 10 percent. The time is placed toward the end of the year and into 1954. But it is recognized that adjustments might further defer any appreciable slump.

However, a drop short of 15 percent is not considered of serious moment. Anyway, the consumption of processed foods will continue at a high level.

*DREHMANN ANNOUNCES...

THE OPENING OF OFFICE AND WAREHOUSE AT 3757 WILSHIRE BLVD., LOS ANGELES 5 TELEPHONE: DUNKIRK 8-5095

Originator and recognized leader of brick floor installation

RECENT WEST COAST INSTALLATIONS

CARNATION COMPANY, Phoenix, Arizona
RAINBO BAKING CO., Tucson, Arizona
CARNATION CO., Bakersfield, California
SAN JOAQUIN BAKING CO., Fresno, California
CONTINENTAL BAKERY, Sacramento, California
CARNATION COMPANY, Spokane, Washington
DAMASCUS MILK COMPANY, Portland, Oregon
CARNATION COMPANY, Houston, Texas

DREHMANN now rounds out its service with a third strategically located operating base. This is good news for food processing firms that own or contemplate building plants on the Pacific Coast and in adjacent states.

Now, given-on-the-spot availability, are all the facilities of Drehmann's unique and comprehensive floor service—design engineering—installation—maintenance. Indeed, in every respect, the Los Angeles branch duplicates the scope of Drehmann's Philadelphia and Chicago operations.

Thus, you have the benefits of Drehmann floor know-how plus the convenience and dependability of local supply. With huge stocks of Drehmann products on hand at all times right in Los Angeles, delivery to jobs is speeded and adequate supplies are assured.

IT ALL ADDS UP TO FASTER—BETTER DREHMANN FLOOR SERVICE FOR THE WEST COAST. VISIT OUR NEW OFFICE THE NEXT TIME YOU'RE IN L.A.

Consult one of our engineers whenever you have a floor problem.

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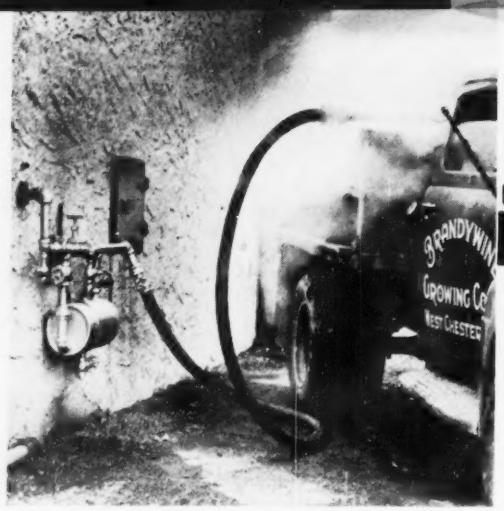
ORIGINATORS OF BRICK FLOORS • ESTABLISHED 1869

DREHMANN

TURN PAGE FOR FOLDOUT FLOWSHEET →

1 **COMPOSTING:** Manure is rapidly fermented before going to growing houses.



2 **STERILIZING SOIL:** Truckloads of top soil are steamed before blanketing mushroom beds.

UNFOLD HERE

Modern Mushroom Canning

Mass-Production Lines Deliver 5,000 Buttons and Stems a Minute to Cannery

WITHIN A DAY, mushrooms are whisked from scientifically controlled growing houses to the Brandywine Mushroom Corp. cannery, West Chester, Pa., for immediate processing.

Growing mushrooms requires extreme care. And that's why Brandywine cultivates most of its own mushrooms.

Mushroom beds must be properly prepared before they will appear. This calls for precautions in fermenting fresh manure and making the beds.

About 6 in. of fermented manure (compost) is spread in the beds, which are then allowed to "sweat out." This procedure that requires slow, steady rise in temperature to 130-140 deg. F. to make the compost favorable for the growth of spawn and to destroy disease spores and insects.

Growing houses are then cooled to about 80 deg. F., the right temperature to plant spawn–Point 4. From here on, the grower must control insects as well as the temperature, humidity, and ventilation in the houses.

After three weeks of spawning, the beds are cased–a 1¼-in. layer of sweet, loamy, sterilized top soil being uniformly spread over the beds. Mushrooms usually appear from 10-14 days after casing. It takes approximately 8-10 days, depending upon the temperature of the growing house, from the time the mushroom first appears until it is ready to pick. Yield at the Brandywine growing houses is about 2 lb. of mushrooms per square foot of growing bed.

Preparing Mushrooms for Canning

Harvested at the peak of perfection, mushrooms are fed to mechanized cutting lines–Point 7–where roots are removed and buttons severed from stems. Roots are discarded, while buttons and stems drop into flumes. Except for inspection belts and processing equipment, mushrooms are handled through the cannery in flumes–Point 8. Fluming removes foreign matter and minimizes much of the bruising that they would otherwise receive.

Mushrooms are put up in three different packs–buttons, slices, and stems and pieces.

Buttons are flumed into a rotary grader with 1¼-in. perforators. Large sizes are discharged onto an inspection belt. From here, they are flumed to a second grader that sorts them into three sizes. Those over 1½in. are blanched and packed as jumbo buttons, while the two smaller sizes (over 1¼ and below 1½ in.) are blanched, sliced, and canned.

Small sizes passing through the first grader with 1¼-in. perforations are sluiced onto a roller-inspection conveyor. Those with broken veils are fed to a nearby flume that delivers them to the stems and pieces line. Buttons passing inspection drop onto a flight conveyor that carries them to an underwater rotary grader.

Purpose of this second grading is to assure packing uniform size buttons, since they are sorted into seven sizes ranging from ½ to 1¼ in. The largest size, however, is fed to the sliced-mushroom line. The remaining six sizes are fed into a Reitz Thermascrew blancher, where they get a 3½- to 5-min. steam blanch.

Leaving the blancher, the buttons travel over another inspection conveyor–Point 11. Those with open veils are introduced to the sliced-mushroom line. Buttons travel along another wire-mesh belt for a further inspection, being automatically flipped over in the process.

Due to the likelihood of shrinkage during blanching, the buttons are regraded into seven sizes–Point 12. Collected in stainless steel troughs, the different sizes are separately fed to filling troughs–Point 14. Uniformly sized buttons are filled and weighed into cans holding 2, 4, 8, or 16 oz.

Now to the stems and pieces line. Stems collected from

PUTTING EXTRA-CARE into its processing lines, Brandywine capitalizes on small details. These make the difference between a high-quality product and one that is merely acceptable. Turn to page 64 for the story behind this top-flight mushroom-canning operation.

---

3 **GROWING:** Houses require proper temperature and humidity to assure quality crops.

4 **SPAWNING:** Mushroom "seed" is uniformly distributed throughout carefully prepared humus.

5 GE

FE PICTURE FLOWSHEET NO. 55

10 **GRADING:** Separated into different sizes, buttons are again checked for color and body.

11

the five cutting lines are flumed to a rotary washer with overhead sprays. Cleaned stems are then flumed to a wire-mesh inspection belt. A bladeless impeller pump then deliver the stems to a grading reel that removes small pieces. Remaining stems and pieces then go to a chopper and an inspection belt on their way to the continuous blancher. Filling and weighing into cans is the next step.

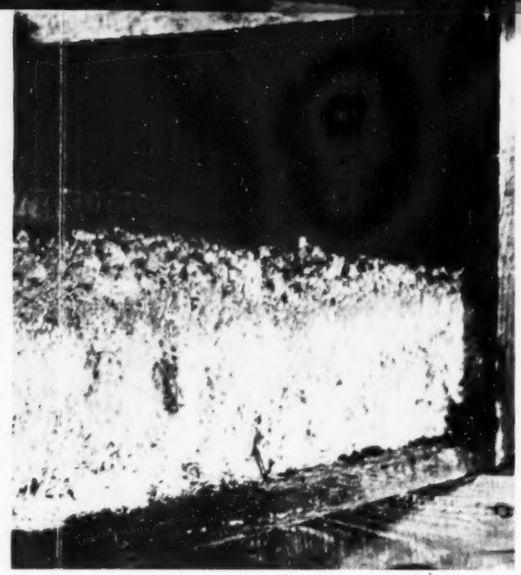
There are three 120-per-min. canning lines for the 2-, 4, and 8-oz. packs. Automatic dispensers add a salt tablet into each can, and water is fed by ten-head rotary fillers. Then four-spindle seamers close the cans.

From a rotary turntable, cans are loaded into retort crates with the aid of an electromagnetic carrier. Crates are then placed in retorts, where they are heat-processed and then cooled.

Cans are thoroughly drained before being fed to a 500-per-min. wrap-around labeler. Labeled cans are then loaded into cases with a semi-automatic packer. Cases are then automatically glued and sealed.

3 **GROWING:** Houses require proper temperature and humidity to assure quality crops.

4 **SPAWNING:** Mushroom "seed" is uniformly distributed throughout carefully prepared humus.



5 **GERMINATING:** Web-like mass of spawn penetrates bed. Soon mushrooms will pop up.

6 HAR
roofs

FE PICTURE FLOWSHEET NO. 55

10 **GRADING:** Separated into different sizes, buttons are again checked for color and body.

11 **INSPECTING.** Still another quality-control point for examining buttons for evidence of blemishes.

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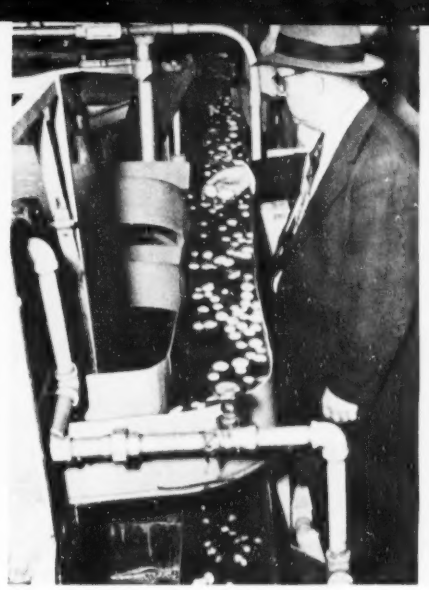
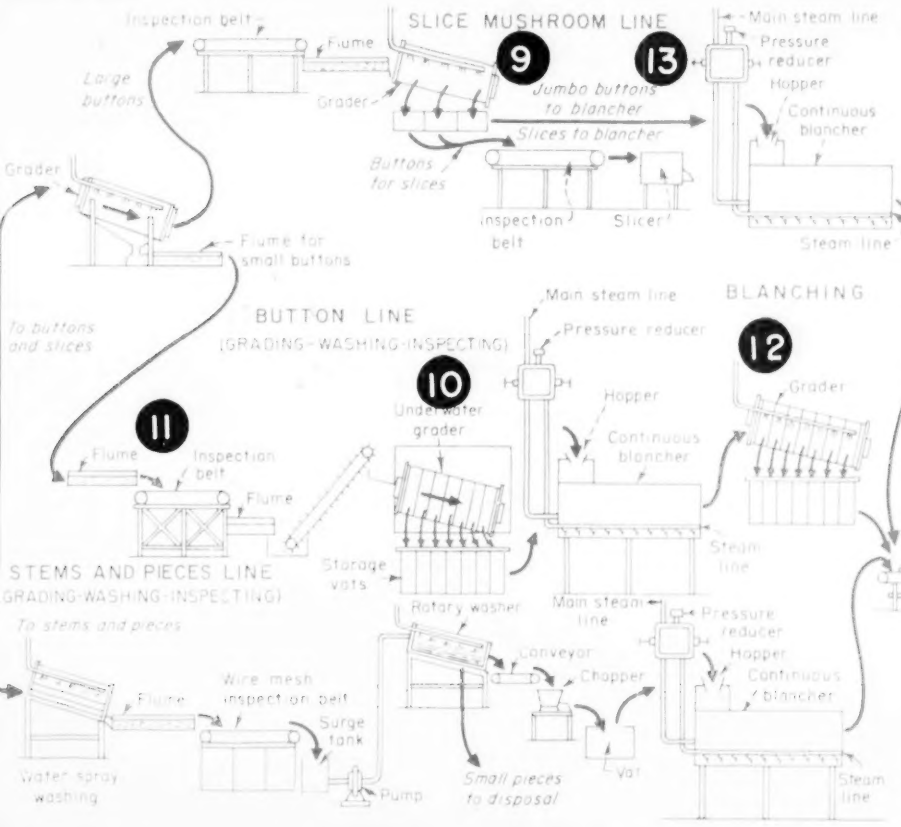
HARVESTING: Mushrooms are picked with roots attached to safeguard flavor.

7 CUTTING: Machine snips off roots and separates buttons from stems.



8 FLUMING: Buttons and stems are washed as they are sluiced to processing.

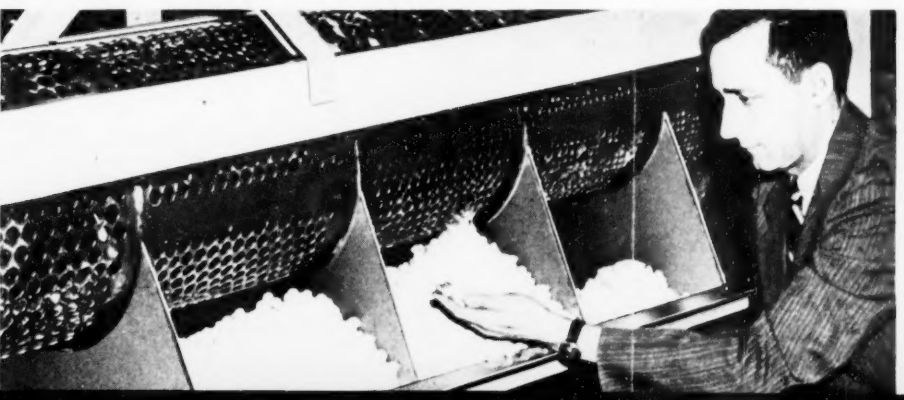
9 CHECKING: Jumbo buttons are inspected as they leave grader.

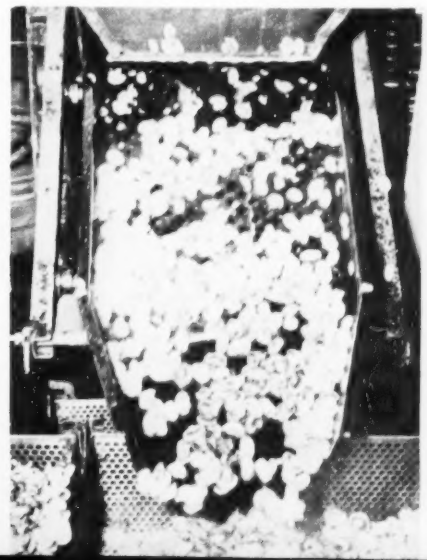


12 REGRADING: This final grading technique assures perfect uniformity in the size of button mushrooms in every can packed at Brandywine.

13 SLICING: Large buttons are conveyed from blancher to automatic slicer.

14 CANNING: Blanched buttons are filled into cans and weighed.





They Shed Splashes

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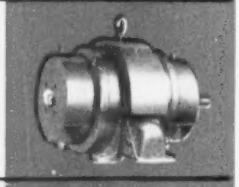
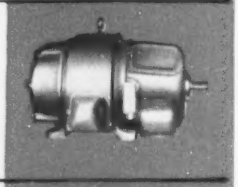


3 to 25 H. Slip Ring Induction 3 Phase *Splash Proof*

30 to 100 HP Slip Ring Induction 3 Phase *Splash Proof*



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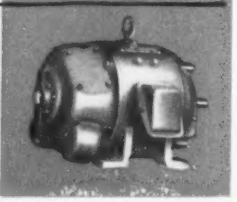

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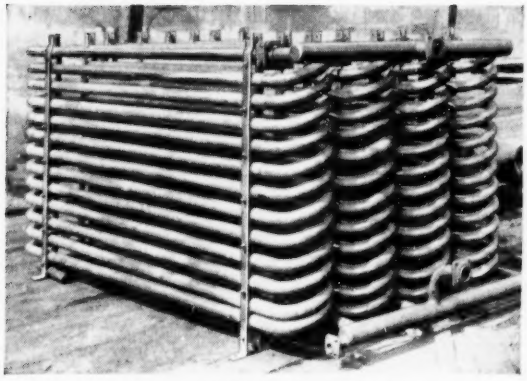

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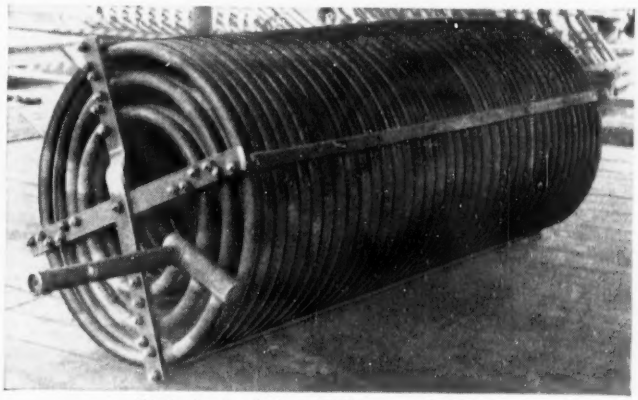

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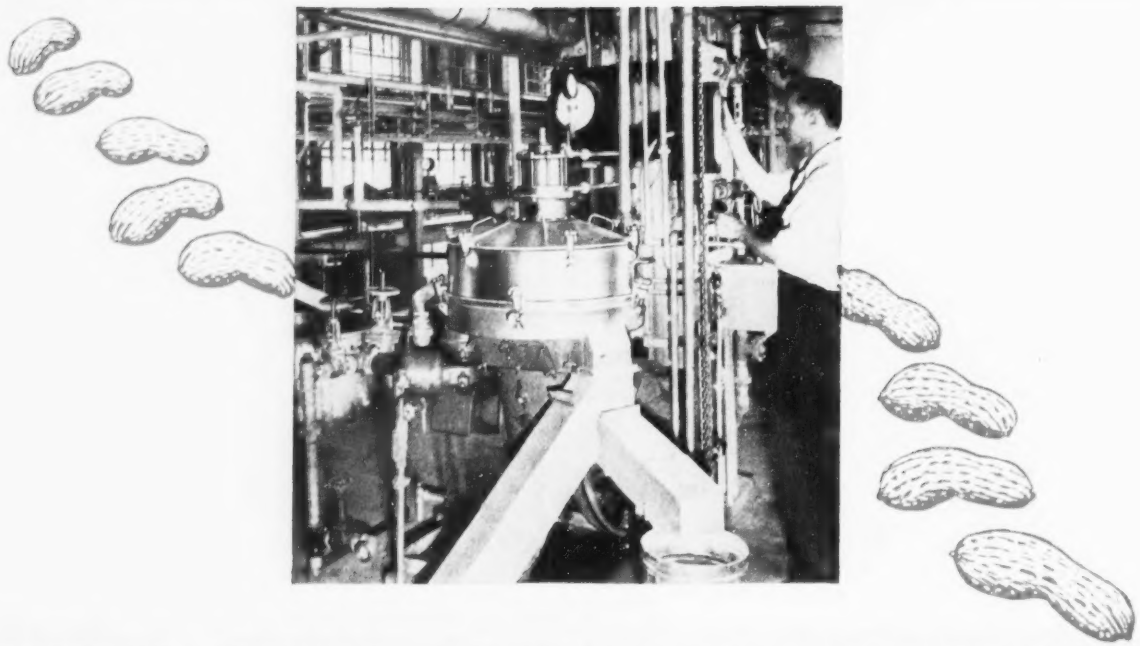

WHY CENTRIFUGE A PEANUT?

Once a food production exclusively, today the peanut is basic raw material for making many things, including bathing suits and glue. In the pilot plant of the Southern Regional Laboratory, U.S.D.A., when undissolved peanut meal must be separated from peptized protein solution, De Laval centrifuges make the separation easily—and ***continuously.***

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One Sure Way to Get MORE DEFENSE FOR LESS MONEY

How can we get more national defense for less money? The best answer yet given to this question appears in a little-noticed section of the new defense budget. That answer, with which this editorial is concerned, is to provide more equipment with which to step up munitions production in an emergency. Thus we can eliminate much of the need to stockpile finished munitions in advance.

The new defense budget provides an appropriation of $500 million, to be invested by the Secretary of Defense in specialized facilities required to produce munitions on a wartime scale, but not adapted to profitable operation by private industry in normal times. Facilities of this type are known as "stand-by capacity."

There is no strictly political controversy over the "stand-by capacity" program. It was originally suggested by Clay Bedford, Special Assistant to the Secretary of Defense during the Truman administration. It has since been reviewed and endorsed by the Eisenhower administration. Moreover, it involves little or no technical controversy. Civilian and military experts are well agreed that the only alternative to enormous expenditures for stockpiling military equipment is to provide enough facilities for producing it quickly in an emergency.

Here is the Key Idea

In his speech of May 19, introducing his defense budget to Congress and the nation, President Eisenhower stressed the value of such reserve capacity in these terms, ***"The more swiftly and smoothly we can mobilize, the less our dependence upon costly standing armies and navies."***

In accord with this idea, the $500 million requested for the present reserve capacity program would be invested in tools that require a long time to produce, and so present grave complications in an emergency unless they are ready in advance. Some such tools would be installed in new plants that are needed to eliminate potential bottlenecks in the defense production program. Others would be ordered to replace that part of the government's present machine-tool inventory which is made obsolete by changes in the design of defense products. By completely "tooling up" with the most modern equipment, the admin-

istration hopes to realize a production potential many times greater than could be achieved by spending the same amount of money on military end-products.

Examples of Savings

In the specialized field of defense production, adequate modern capacity is the key to both economy and speedy delivery in a pinch. Here are some striking examples from the recent report of the Advisory Committee on Production Equipment (Vance Committee) to the Director of Defense Mobilization:*

– In the case of certain ammunition components, the cost of new capacity can be recovered in only six weeks of full production.

– If $500 million worth of special tools needed to make aircraft are purchased in advance, aircraft production during the first two years of war will be increased about $18 billion. In other words, it costs 1/36 as much to acquire the tools in advance as to acquire the aircraft.

– In the case of a certain ordnance item, an expenditure equal to the cost of only 150 units of the item will provide the capacity to produce thousands and save three years' time in meeting mobilization requirements.

Moreover, reserve plants and equipment can be kept up-to-date at only a small fraction of the cost required to maintain an up-to-date reserve of military end-products. The cost of replacing 5,000 obsolete tanks is at least $1 billion. The cost of new tools for a tank plant would be less than 10% of that amount.

*This Committee, headed by Mr. Harold Vance, President of the Studebaker Corporation, included Clay Bedford, then President of Chase Aircraft, Manly Fleischman, former Defense Production Administrator, and several retired military leaders with wide experience in procurement.

Savings Will Multiply

On the basis of facts like these, the Vance Committee recommended that the Defense Department spend $500 million to $800 million per year on specialized defense production facilities in order to provide substantial reserve capacity as soon as possible. It also recommended that expenditures for military end-products which get obsolete rapidly be held to a minimum. The Eisenhower administration has adopted this approach to the problem of munitions production in asking that $500 million be invested in reserve capacity.

The importance of this approach is much greater than is indicated by the amount of money to be spent on new tools, although this amount will go far toward assuring a healthy machine tool industry, adequate to meet emergency demands. ***What is really important is the great saving that can eventually be made in the cost of our defense program by a modern tooling program.*** If we are to maintain this program for a long period, and if we are to pay as we go, we must have a low-cost program. No other plan to reduce and control the cost of a garrison economy can compare with the new approach suggested in the Vance Report and now embodied in the new defense budget.

Congressmen will do well to scrutinize all military appropriations carefully. They have a chronic tendency to be too big. But there should be no penny-pinching on investments in capital equipment that will pay out in as short a time as six weeks in a war emergency. It would be tragic if this opportunity for real economy were lost in the controversy over other aspects of the defense program. ***The tooling program is a key part of the Eisenhower effort to cut defense costs. It should be promptly approved.***

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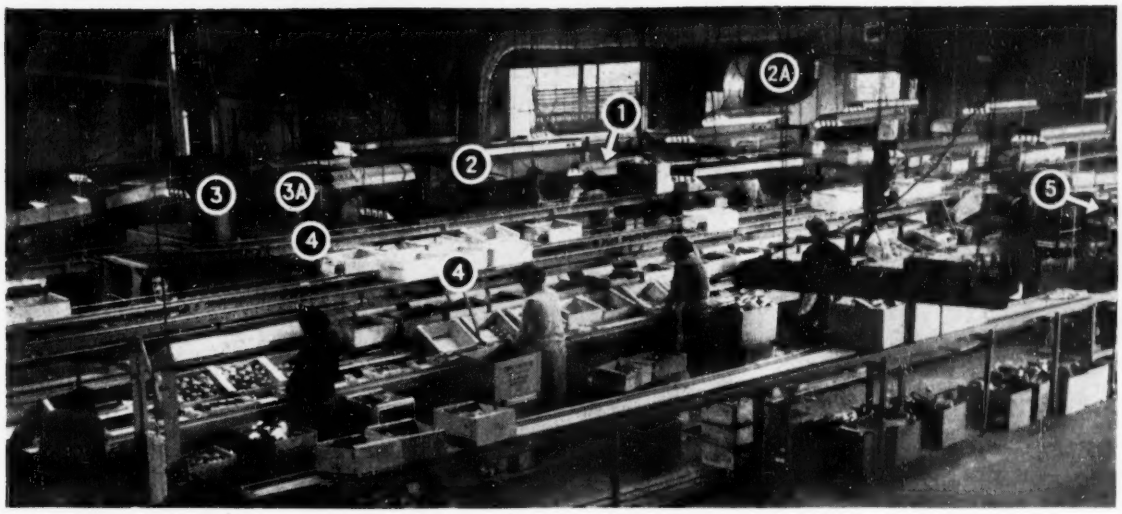


PREPACKAGING five rail-cars of fresh tomatoes daily: (1) Dumping, (2) paper wrappers removed by suction of fan (2A), (3) Flavorseal unit equipped with germicidal lamp (3A), (4) hand-packing lines, and (5) wrapping machines.

Adds Life, Guards Quality Of Prepackaged Tomatoes

And Mechanized Line Multiplies Output

C. R. HAVIGHORST
Senior Associate Editor, "Food Engineering"

Since prepackaging's inception, operators have been wrestling with two major problems: (1) to obtain mechanical equipment that would lower production costs and increase production volume and, (2) to find a supplemental means, in addition to refrigeration, that would prolong the market life of these prepackaged foods.

It now looks like a turning point has come. At least for the prepackagers of tomatoes. One of the leaders in these advances is New England Tomato Co., Los Angeles. Perhaps the first western prepackager of tomatoes, this company started in 1939, when nearly the entire process was manual. Mechanization has been slow. Prepackers have had to depend largely upon their own ingenuity to devise processing equipment.

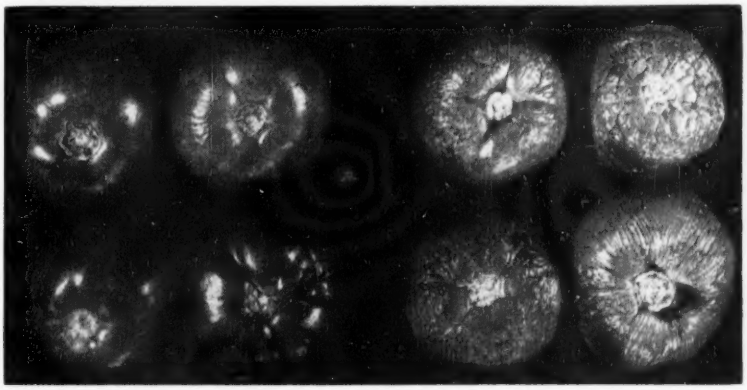
But for some time Food Machinery & Chemical Corp., Riverside, Calif., has had a stake in prepackaging. Its copyrighted Flavorseal coating method prolongs the market life of certain fruits and vegetables (*Food Industries*, April, 1945, p. 96) one of which is tomatoes. Now parlaying this stake into somethnig more interesting, FMC is both adapting equipment used in the citrus industry and devising new machines for tomato prepackaging. The line at New England has—

▶1. Increased previous 8-hr. daily production from some 8,000 packages (containing four tomatoes each) up to 100,000 packages. And new equipment now in the blueprint stage promises to up this output at least another 20 percent.

▶2. Prolonged the market life of tomatoes. Flavorseal, combined with prepackaging and refrigeration (45-55 deg. F.), gives ripe tomatoes a market life of 12-14 days compared with only 5-6 days for untreated fruit. Under similar conditions it extends the life of pinks 21-24 days. In addition, through carefully controlled distribution, most spoilage at retail outlets has been eliminated.

At New England, 100,000 packages of tomatoes represents approximately 44 tons. And when this daily production is projected for the entire 9½ months of the packing season (September through June 15), a total annual figure of around 9,500 tons is chalked up. To provide this long packing season, tomatoes are not only contracted in California but there are also supplemental rail car shipments from Florida, Texas, and Mexico.

Tomatoes are shipped in 33 lb.-net retail-type lugs. These are dumped



EXAMPLES of treated fruit (left) and untreated (right) of same lot after 23 days' storage. Waxy solution prolongs tomatoes' life by retarding respiration and reducing by 50 percent the moisture loss through transpiration.

Containers that *Protect* your product ALL THE WAY

Sturdy steel drums and pails—made with care and accuracy in every detail make certain that your product quality receives protection *all* the way to its destination. They make certain that your products remain safely sealed through the various conditions of handling and shipping.

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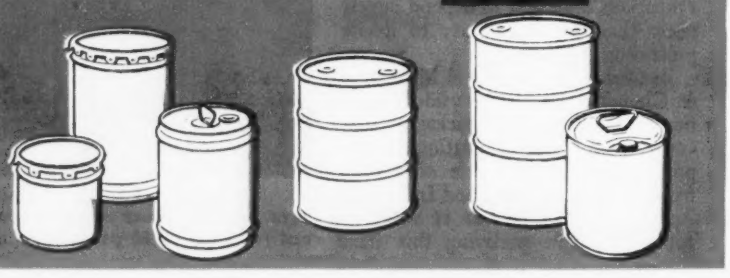


manually on the feed conveyor. Paper wrappers on the fruit are loosened by hand. The roller conveyor moves both fruit and wrappers under a hood where air suction draws the paper through a duct to a disposal point. Empty wooden lugs are placed on an overhead conveyor and are thus moved to the end of the line. Here they are used as containers for the prepackaged fruit.

As the fruit emerges from the hood, pickers remove any that are overripe. The conveyor then moves the fruit under a Westinghouse germicidal lamp and into the Flavorseal unit. Two germicidal lamps are employed—at the entry and exit of this unit—to kill mold growth on the fruit.

All tomatoes are so treated, whether they are immediately prepackaged or moved into coloring rooms. The Flavorseal retards the natural decomposition of the fruit, such as shriveling, wilting, and loss of flavor.

To prolong market life of tomatoes, the rate of oxidation must be retarded and excessive transpiration prevented. Respiration must not be entirely stopped for tomatoes will not color properly if atmospheric oxygen is lacking.

Close-Up of Coating

To the naked eye, the Flavorseal coating appears as a continuous encasing film. Under a microscope, however, the film is revealed as a porous coating made up of small spray specks. The porosity of the film is obtained by a careful choice of solvent, wax, nozzle, and pressure. These factors provide spray particles that will adhere to the fruit as individual specks and not run together to form a complete seal. By varying the porosity of the film, the respiration and transpiration rate of the fruit can be controlled to give optimum results. The film is approximately .00015 inch in thickness

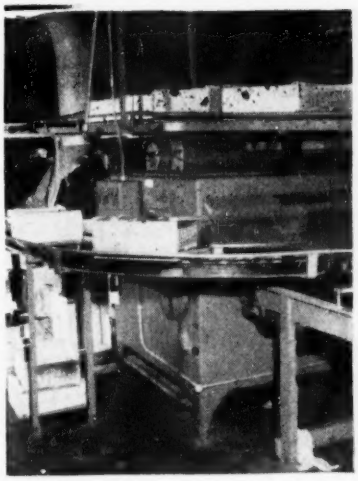
During the coloring period, ripening tomatoes may lose from 1½ to 3 percent in weight, depending upon the time required to color. This coating will reduce moisture loss by 50 percent. In addition, it keeps the fruit plump and firm for a longer time after it is packaged. The wrinkled condition that appears around the stem end of the fruit after loss of about 4 percent of original moisture is delayed on the average of from 4-5 days up to 12 days.

The coating consists of a blend of waxy ingredients dissolved in a petroleum hydrocarbon solvent. The solvent is one of the very volatile cuts of petroleum distillate and acts merely as a carrying agent for the dissolved waxes.

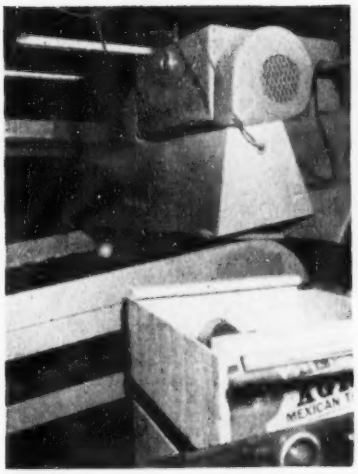
The unit that applies the coating

(*Turn to page* 135)

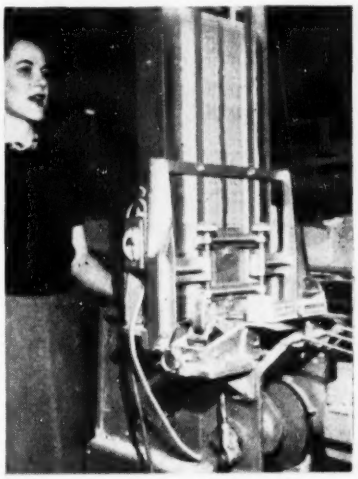
Photo-Tour of Line



COATED fruit goes to hand-packers on center conveyor. Upper one, empty lugs; lower right one, green fruit.



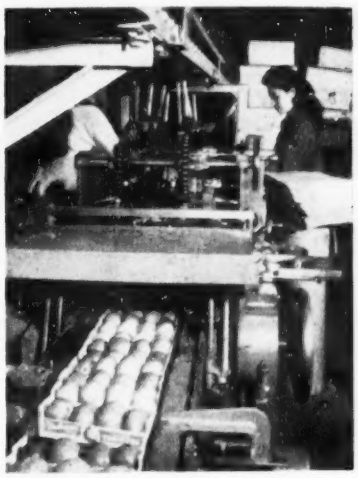
GERMICIDAL lamps (installed under hoods at entry and exit of Flavorseal unit) kill mold spores on fruit.



TRAYS are formed 90 per min. by three tray-erecting machines.

HAND-PACKERS fill trays moving on belt conveyor—four tomatoes each.

PACKERS select tomatoes of equal size and ripeness for each tray.



FILLED trays go through three wrapping units, are packed in lug boxes.

This is Why the Nash is the Most Simple Compressor

It's the Nash!

There are no mechanical complications in a Nash Compressor. A single moving element, a round rotor, with shrouded blades, forming a series of buckets, revolves freely in an elliptical casing containing any low viscosity liquid. This liquid, carried with the rotor, follows the elliptical contour of the casing.

The moving liquid therefore recedes from the rotor buckets at the wide part of the ellipse, permitting the buckets to fill with gas from the stationary Inlet Ports. As the casing narrows, the liquid is forced back into the rotor buckets, compressing the gas, and delivering it through the fixed Outlet Ports.

Nash Compressors produce 75 lbs. pressure in a single stage, with capacities to 6 million cu. ft. per day in a single structure. Since compression is secured by an entirely different principle, gas pumping problems difficult with ordinary pumps are often handled easily in a Nash.

Nash simplicity means low maintenance cost, with original pump performance constant over long periods. Data on these pumps sent immediately on request

- No internal wearing parts.
- No valves, pistons, or vanes.
- No internal lubrication.
- Low maintenance cost.
- Saves floor space.
- Desired delivery temperature automatically maintained.
- Slugs of liquid entering pump will do no harm.
- 75 pounds in a single stage.

NASH ENGINEERING COMPANY
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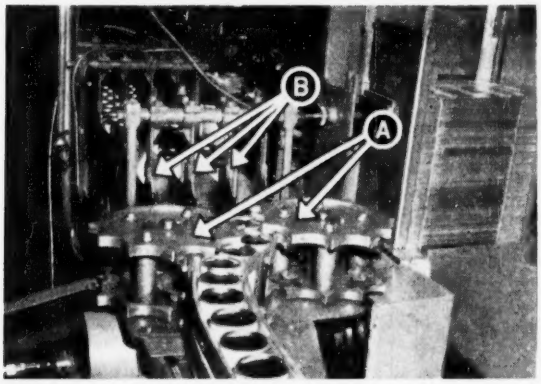
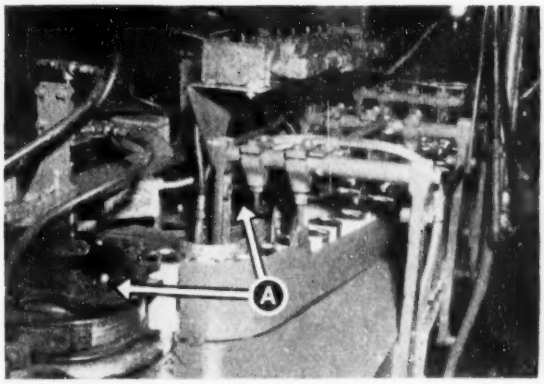
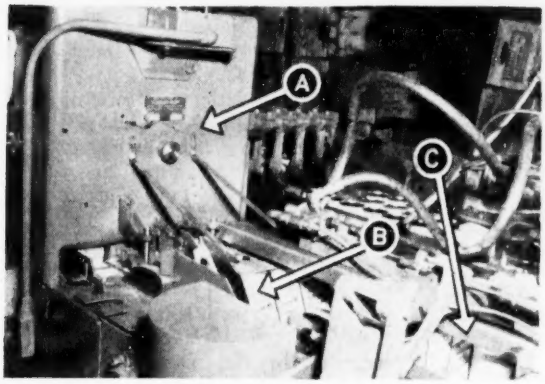
Close-Ups of High-Speed Cartoning Machine



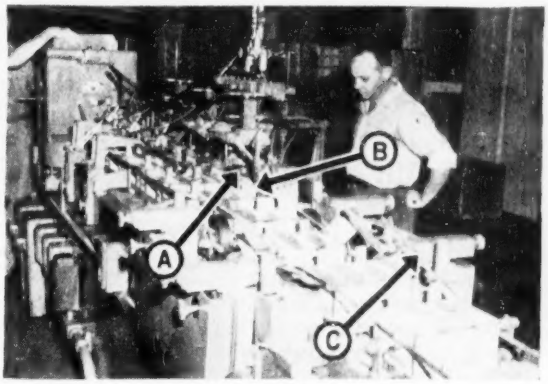
MAGNETIC STAR WHEELS (A) divide single row of upright beer cans into three lanes (B).



THREE twin-pocket star wheels (A) load two cans at a time into cartons. Unit has "no-can, no-carton" device.



CARTONS are fed from magazine (A), erected (B), and then loaded with six cans (C).



FLAPS are glued (A), tucked by kicker bar (B) and plows (C). Then cartons go to compression belt.

Specially Engineered Cartoning Systems

Speed Brewers' Half-Dozens

Cans are divided into three rows, fed to twin-pocket star wheels, and loaded six to a carton, which is glued and sealed. Rates: 330 and 550 cans per min.

FE STAFF

A major packaging change has taken place in the brewery field—a move to a 6-unit economical sales package that stimulates the customer into the "half-dozen habit."

The trend began with a multiple beer-can package soon after the first 6-bottle packs appeared in the soft-drink field.

To meet the growing 6-unit demand, some breweries have installed fully automatic cartoning equipment. One such system handles 330 cans a minute, another 550, both operating now in essentially the same manner.

Latest cartoning machine installed at Liebmann Breweries of Brooklyn features safety, "no-can, no-carton," and "no-carton, no-can" devices. Here is how it operates:

Cans enter a pair of dividing star wheels single file and in an upright position and are separated into three lanes. One can is drawn into the left-hand wheel by a magnet and stripped off into the left-hand lane. The next can is pulled by magnet to a pocket of the right-hand wheel and stripped off into the right-hand lane. And the third can enters the divider wheels into a pocket without magnets and travels straight-through into the middle lane.

If any entering can causes a jam-up, a three-ball safety clutch on the horizontal shaft driving the wheels is thrown out, breaking the circuit through a microswitch to stop the machine. The wheels are then manually reversed to remove the jammed can and enable the three-ball clutch to reseat itself. The machine is then restarted by a pushbutton.

Traveling on a flat-top chain conveyor with side rails, the three rows of cans go to three twin-pocket star wheels,

Looking for a Better Carton at LOWER COST?

Weston found the answer with our Model PA Carton Former

This sturdy corrugated carton for Weston Biscuits eliminates the need for a glassine liner, and when overwrapped, gives full protection and identification to the product.

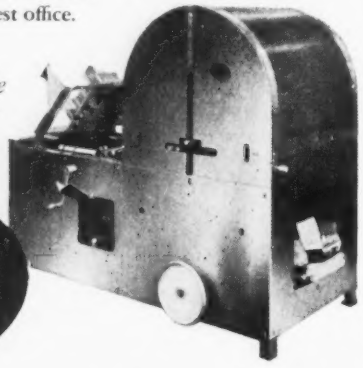
Chances are that the machine which makes the Weston carton can make the type of carton you require *at a welcome saving.* For our Model PA Carton Former can be adapted to many styles of cartons and any plain or printed carton stock.

With a PA Carton Former in your plant, you buy *inexpensive die-cut blanks* in place of costly finished cartons. That makes an immediate saving which alone pays for the machine in a short time. And you have no labor problem, because the PA machine requires only part-time attention of one person.

Turns out up to 102 accurately-formed, firmly-glued cartons a minute. They are discharged right-side-up and can be automatically conveyed to filling stations. Cartons in various sizes can be made on the PA machine, which is easily adjustable. Occupies only 3′ x 6′ of floor space.

Kraft Cheese, Bayer Aspirin, Welch Candy Bars, Gillette Razor Blades, Lipton Tea, Philip Morris Cigarettes are among the many products now going to market in cartons made on our Model PA. Hadn't you better get all the facts on this cost-cutting machine? Consult our nearest office.

Write for literature on the Model PA Carton Former



PACKAGE MACHINERY COMPANY
SPRINGFIELD, MASSACHUSETTS

NEW YORK CHICAGO BOSTON CLEVELAND ATLANTA DALLAS
DENVER LOS ANGELES SAN FRANCISCO SEATTLE TORONTO MEXICO, D.F.

which load cans into a carton two at a time to make a 6-can pack. Each loading star wheel is mounted over a three-ball safety clutch to "throw it out" similarly to the divider wheels.

Erection of cartons, prior to filling is automatic. Employed are specially designed cartons that are fully scored and pre-broken so that they can be easily formed without causing jam-ups.

Cartons in the flat are fed from a magazine. A feeder bar slighty lifts the stack of cartons so that a shallow step selects only the bottom carton and feeds it into transport fingers. As the carton emerges from the magazine, it moves under a treadle as parting blades separate the end flaps. The short flap goes below and the other three pass over the parting blades.

The top three flaps are bent by a plow as the long transport fingers pick up the carton where the feed fingers left it. At the same time, two ¼-in. rods mounted on the tail shaft (the shaft that carries the sprockets for the three transport chains) enter oblong slots in the cartons to force it open about 1 in. This operation facilitates erection of the carton by the transport fingers.

Located on the drive shaft of the carton-feed magazine is a slip clutch for allaying carton jam-ups. In the event a carton should cause a jam, resistance created will overcome the tension of a spring holding the engaged clutch. And the power thus exerted by the machine pulls the clutch open. This action breaks contact in a normally closed microswitch to stop the machine.

"No Carton, No Can" Device

A special detector permits continuous operation of the machine even though a carton is not properly opened or being fed to the opening device. In the event of either trouble, this "no carton, no-can" unit's feeler bar, mounted on the top-carton guide, drops into a void created and actuates a 4-way air valve. This, in turn, operates a small double-acting air cylinder located directly over the can-fed star wheels. When actuated, the cylinder releases a dog that is engaged in a 3-point clutch that is bolted to the 3-point can-feed star wheels. The clutch is then disengaged to stop the star wheels.

Also there are three "no-can, no-carton" detectors and three safety clutches, one for each can-feed star wheel. There is also a 2-point clutch on the in-feed dividing star wheels. This operates in the same manner as the previously described clutch on the can-feed star wheels, with the exception that here the dividing wheels are timed to hold back six cans whenever

a carton is missing, whereas each of the three can-feed star wheels hold up two cans.

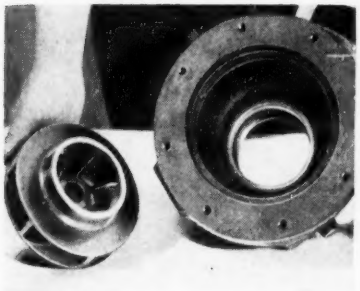
After a carton is filled, a kicker closes the left side flap, and the bottom flap is deflected below the top rails to pass over a tapered glue roll. The latter is plowed up to close, and the top flap passes over a second glue roll. The top flap is then plowed down, and the carton is carried to a 28-ft. compression unit by a pair of V-belts traveling faster than the transport section of the cartoner.

Glue rolls are driven, through an overrunning clutch, by separate ¼-hp. motors that keep them running constantly, thus preventing the glue from setting. Too, a doctor-blade adjustment can be made to supply the desired thickness of glue on the flaps.

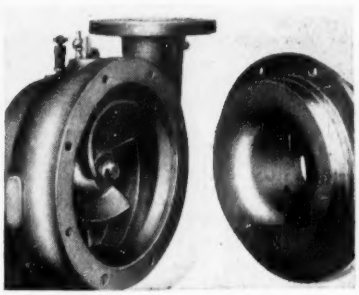
Cartons are packed semi-automatically six to a case. And the cases are automatically glued and sealed.

At Storz Brewing Co. of Omaha, an earlier model cartoning system features a company-rigged air-jet device that automatically inserts a promotional folder into each multiple-can pack.

These cartoning systems at Liebman and Storz were developed by Standard-Knapp–Emhart Mfg. Co.



ENCLOSED-impeller pump with radial clearance wearing ring which can be replaced to maintain efficiency.



OPEN-impeller pump. This unit has special suction cover with contour matching that of impeller-vane edges.

Selecting Pump Impellers

Open? Or Closed? Which is best suited to your particular requirements? Here are pointers

J. A. CABLE
Application Engineer, Norwood Pump Section, Allis-Chalmers Mfg. Co., Milwaukee

Engineers choosing a centrifugal process pump often face this poser: What will it be—*open* or *closed* impeller?

Actually, in very small-capacity units there is often no choice, because casting limitations make open impellers a necessity. However, when you get into medium and larger capacities, various factors enter the picture.

In general—on the basis of good hydraulic design—it is desirable to use closed impellers in most applications. However, open impellers are better when the following conditions exist:

1. The liquid handled tends to coat or scale the surface of the pump interior. This build-up on the impeller side-walls will restrict flow and reduce output. It may also cause a binding of wearing surfaces.

Open impellers will, in part, be self-cleaning and less apt to bind in this case. Also they will clean up more easily, especially if such cleaning is by scraping or acid-bath treatment.

2. If solids in solution being pumped are larger than the passage between vanes and thus tend to break when manipulated. However, one should be sure that the solids *will* break up when so handled. For it is far better to have an occasional oversize piece plug up a closed impeller than to have a similar wedge between open impeller and casing. The latter markedly decreases capacity and efficiency.

Why are closed impeller pumps of basically better hydraulic design? Primarily this is due to the replaceable companion wearing parts that make it possible to renew clearances occasionally and secure better overall performance for head capacity and efficiency.

With the open impeller—without companion wearing surfaces—after wear takes place it becomes necessary to replace major parts, such as impellers and casings or suction covers.

SCRUBBING CORROSIVE GASES ?

Fig. 645

Are your scrubbing nozzles as efficient as you think they could be? Do they resist the corrosion or wear conditions satisfactorily — produce the breakup and distribution you would like?

Outline your spray problem for use — if your liquid can be sprayed with direct pressure at all — Monarch can furnish the nozzles.

NOZZLES FOR:
- OIL ATOMIZING
- HUMIDIFYING
- AIR WASHING
- DESUPERHEATING
- SPRAY PONDS
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- ACID CHAMBERS
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ENGINEERING News

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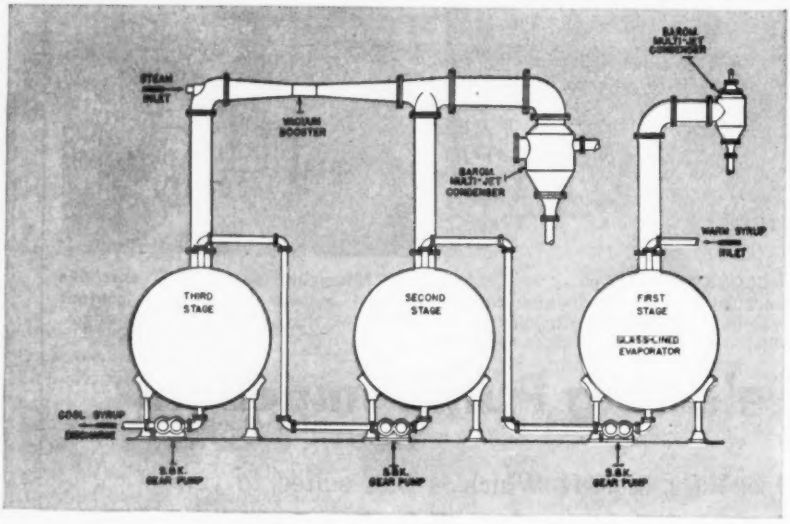
ROTAMETERS • FLOW INDICATORS • RADIAFIN TUBES • VALVES • SPRAY NOZZLES AND ATOMIZERS • GEAR PUMPS • DESUPERHEATERS

AMERICAN MOLASSES COMPANY USES SK HIGH VACUUM COOLING APPARATUS TO CUT SUGAR SYRUP TEMPERATURE IN HALF

The job of cooling sugar syrups after processing at the Brooklyn, N. Y. plant of the American Molasses Company has been handled since 1940 by the SK High Vacuum Apparatus shown in the diagram.



This apparatus cools 72 Brix sugar syrup at the rate of 50 gpm from 180° F. to 90° F. discharging the syrup at 76 Brix. Cooling is performed in 3 stages as indicated in the diagrammatic arrangement shown here. The first effect operates at 22" Hg. Vacuum; the second effect at 28" Hg.; and the third effect at 29.46" Hg.

Components of the SK High Vacuum Syrup Cooling Apparatus include: Two Barometric Multi-Jet Condensers, a Steam Jet Vacuum Booster, and SK Gear Pumps.

Syrup is pumped, by means of SK Gear Pumps, and is cooled by spraying in successive flash tanks until it is discharged from the third evaporator tank.

Hot syrup is delivered to the first stage evaporator tank. Water, under pressure, is then pumped through the jets of a Barometric Condenser, thus creating a vacuum which "flashes" vapors from the evaporator tank thereby cooling the syrup. The syrup is then pumped to the second stage evaporator tank, where the syrup is further cooled by the same flashing process.

A Steam Jet Vacuum Booster is installed on the third stage evaporator tank to maintain the high vacuum required for final cooling to required temperature.

The entrained vapors issue from the venturi of the Vacuum Booster and are delivered to the second stage Barometric Condenser.

The American Molasses Company finds that SK High Vacuum Syrup Cooling Apparatus permits higher filtration rates due to reduced density before cooling; requires no operating labor; is completely sanitary; and requires little maintenance.

For many years SK has been engineering and manufacturing High Vacuum Equipment for the Food Industry. This equipment is being used in connection with processes such as the one illustrated as well as the making of frozen fruit concentrates and others. If you have a requirement for such equipment, contact SK, outlining your requirements, and SK engineers will make equipment recommendations.

SCHUTTE and KOERTING Company
Manufacturing Engineers
3rd STATE RD., CORNWELLS HEIGHTS, BUCKS COUNTY, PA
REPRESENTATIVES IN PRINCIPAL CITIES

For more information, use coupon on page 159.

Prepackaging Tomatoes

—Continued from page 129

consists of a chamber about 6 ft. square and 5 ft. high. A 4 ft. roller conveyor moves the fruit through the chamber and, at the same time, continually revolves it so that all sides are exposed to the spray. Mounted above the conveyor are two nozzles. The solution is sprayed through these at a pressure of 20-50 psi., producing a highly atomized, cool mist.

Discharge of the spray over the fruit is modified by supplemental air blasts to give greater speed and reach to the wax particles. The air blast changes the spray from its initial cone shape to a flat sheet and delivers the atomized wax at a high impact velocity to the surface of the tomatoes. Wax solution is pumped from a 550 gal. underground storage tank.

One Can an Hour

An exhaust blower, mounted near the discharge end of the unit, removes spent spray and solvent vapor from the chamber and discharges it through a duct to outside air. Capacity of the applicator is one rail-car of tomatoes an hour. The unit may be adjusted to handle from ¾ to 1½ cars by control of the speed of the conveyor, size of nozzles, and the hydraulic pressure. It requires but 10 sec. for a tomato to pass through the unit.

At the exit side of the applicator, pickers remove fruit that is to go to coloring rooms. The remainder, which is ready for packaging, is filled into lugs and placed on a conveyor serving the 27 handpackers. These workers select the fruit by color and size and pack four tomatoes in each pre-formed paper tray. Filled trays are placed on a belt conveyor leading to the wrapping machines. There are three of these packing lines, each 84 ft. long, and each feeds to a Package Machinery Co. FA model wrapping unit.

Tomatoes exude an ethylene-like gas, carbon dioxide, and moisture. So the 1005-600 acetate celanese wrapping film, which is a gas- and moisture-proof type, is ventilated with two ¼-in. dia. perforations. The fruit must have sufficient oxygen from the air for normal color and flavor development.

The fruit, prepackaged in this vari-color wrap, is re-packed into wooden lug boxes, 20 packages to the box, and is ready for shipment to market.

End (*Resume reading on page 131*)

Vinegar in Volume

—Continued from page 89

all times and obviates this difficulty.

Key instruments are three well-lit bold-reading temperature indicators mounted at levels outside each generator and connected to rigid bulbs planted deep into the beechwood chips. A double-pole electric control is offered by these units, which have their sealed wire-mercury contacts preset at an exact point in the factory.

Atop the generator, feeding recirculating infusion to a rotating sparger wheel with several arms, is a unique stoneware receiver containing five solenoid-operated, ball-seated poppet valves. Each of these valves increases flow to the sparger when desired.

This variable trickle rate is automatically determined by the temperature indicating units, thus presenting a positive control of the rate of reaction in the generator.

Normally, one poppet valve in the receiver is always open and thus delivers a minimum infusion to the sparger distributor. However, when temperature in the upper shaving level goes above 28 deg. C., its controller

Preview List of Coming FE Articles

Special features emphasizing the "what, why, and how to do it" are scheduled for early issues of FE—all "engineered" to help you produce higher quality foods at lower costs. These are just a few of them—

Electronic Sorters Do Work of 200 Employees
Continuous Mixing Simplifies Processing
New Coating Process Seals in the Flavor
Higher Court Decisions on Food Litigation
How To Improve Ability of Your Foremen
What's New in Materials Handling Devices
Making Food Plant Cleanup More Effective
Insulating To Improve Quality and Effect Savings
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Concentrated sodium hypochlorite solution for bactericidal use in food plant operations. Rapid and effective for sanitizing all types of equipment. Clear solution, always ready for use. No dissolving or settling necessary. Leaves no sediment or residual film.

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5. Adds gloss to products
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Decatur, Illinois

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opens the second feed valve. Similarly, the mid-level controller will open the third poppet valve when it reads above 31 deg. C. And when the lower level exceeds 33 deg. C., its associated controller will open the fourth poppet to produce further increased flow.

The fifth valve in the receiver is normally closed, but can be opened by short-circuiting if it's desirable to increase the trickle rate through the generator to maximum flow.

During start-up and recharging, this cascaded system giving automatic feed control is invaluable. It provides a gradual build-up of trickle rate and recirculation until the generator is operating at top capacity.

Automatic Cooling

While circulation control and the forcing of excess air through the shavings provides a positive grip on generator temperature, it is also necessary to cool the recirculating infusion, which can get as warm as 35 deg. C. This is accomplished by a concentric pipe heat-exchanger (girdling the lower part of the generator) using well water as a coolant.

Automatic control of infusion chilling involves a fourth temperature controller which has its bulb set into the pipe leading from the receiver to sparging wheel. This opens a solenoid valve in the line supplying cooling water to the heat-exchanger, when needed.

However, the lower level controller on the generator can "over-ride" this coolant control. It has an extra contact tied electrically to a similar extra contact in the coolant controller. Cooling action will thus start if the temperature should climb at the base of the generator.

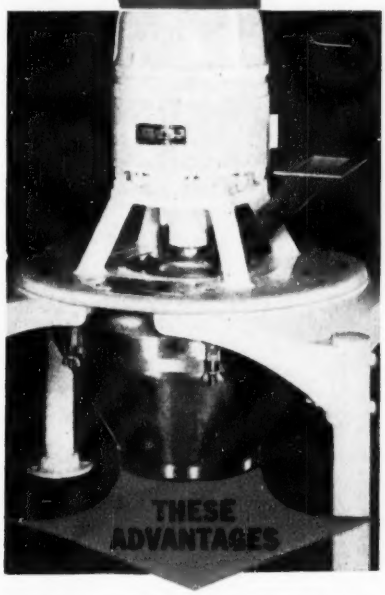
Two flowmeters—visible at the side of the generator—provide a visual check on the pumping rate of infusion recirculation and on the forced air flow rate. Also, an indicating flowmeter affords readings of coolant flow. All flow rates are adjustable by hand valve.

On top of the generator there is—in addition to the receiving crock mechanisms and sparge feed system—an exhaust pipe with a calibrated damper. The latter can be set exactly to balance air exhaust with forced air input. Also, an oxygen analyzer is kept handy at this location to determine the amount of oxygen reduction (the unit is operating at top efficiency when bacterial action has lowered oxygen in the exhaust air to 10-12 percent).

Operating Facts

Since the new generating plant first went on-stream about a year ago, the company has been pleasantly surprised

"ENTOLETER"
HIGH SPEED MIXER



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The "ENTOLETER" HIGH SPEED MIXER corrosion resistant material (stainless...monel ...chrome plate)

LOWER COST ... high production rate per horsepower used

BETTER QUALITY ... high speed centrifugal action breaks up pockets or agglomerates of unmixed ingredients, producing a homogeneous blend

COMPACT INSTALLATION ... requires less than 6 square feet floor area

SIMPLIFIED MAINTENANCE .. equipment designed to facilitate cleaning ... discharge hopper and mixing rotor completely demountable

Additional information concerning flow rates to **40,000 pounds** per hour supplied upon request ... write

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at its self-sustaining, trouble-free performance.

In the old method, employing 310 4x8-ft. acetifiers, two men were kept busy full-time in a sizable floor area. The new operation requires only one man on a part-time basis.

Actually, the only specific supervisory functions necessary are periodic acid-and-alcohol tests of the vinegar in each collecting chamber to determine when batches are finished, oxygen determinations on exhaust air, and attendance to the proper pipe hook-up in charging and discharging.

When the vinegar indicates an alcohol content of less than 0.5 percent, it is considered finished and is pumped from the generator to storage for proper aging.

End (Resume reading on page 90)

Quality at Fast Pace

—Continued from page 66

dle forces the stems through a series of stationary knives. Prior to blanching and filling into cans, chopped stems and pieces are inspected in a 3x8-ft. stainless tank with 2½ ft. of fresh water.

From the filling and check-weighing line, cans travel to three canning lines for 2-, 4-, and 8-oz. packs. Speed of each line is 120 cans per min. Ten-head rotary fillers introduce hot water, and an automatic tablet dispenser adds salt into the cans. Four-spindle seamers then close the cans, which continue to a turntable.

Retort Loader; Cook Check

An electromagnetic carrier, attached to a retracting pulley, is employed for loading a dozen cans at a time into retort crates. By pressing a button on the carrier, an operator cuts off current to release cans into crates. The same device is also used for loading heat-processed cans from crates and onto the unscambler feeding the wrap-around labeler.

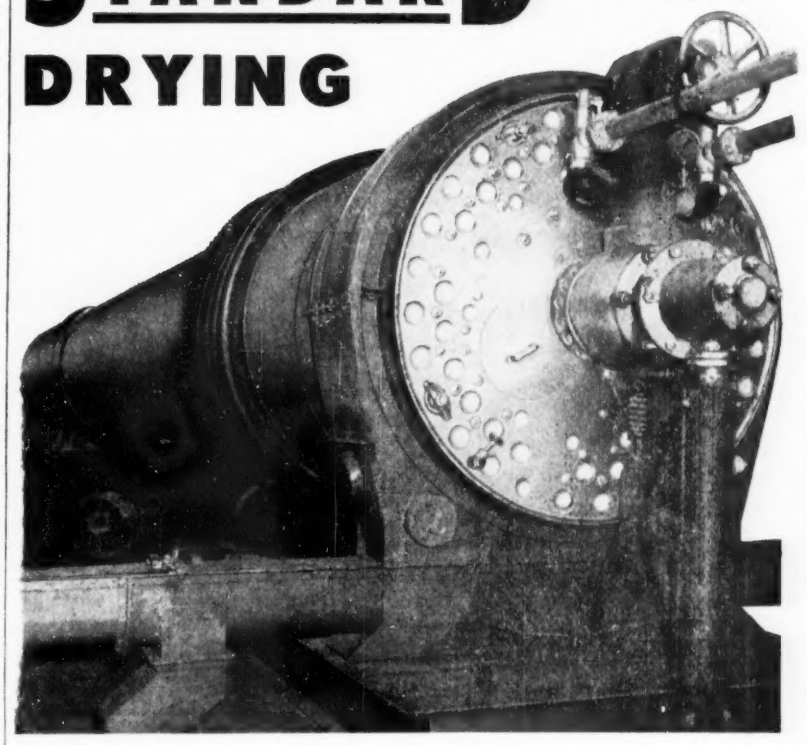
Crates are now reeled to an electric hoist to two retorts, each holding three crates.

As a safeguard against human error in heat processing, two precautionary measures are taken at the Brandywine cannery. First, an automatic temperature controller is hooked up with a timing clock that simultaneously rings a bell and flashes a red light at the end of the cook. Second, an ATI Cook-Chex retort tag is attached to each crate. Only when the tag turns green are the canned mushrooms fully heat-processed.

Draining of the cooled cans is now

HOW THE HURON MILLING COMPANY obtains "Cleanliness and Economy" through

STANDARD-IZED DRYING



STANDARD-HERSEY dryer does work of 16 pairs of hot rolls . . .

In operation at the Huron Milling Company, Harbor Beach, Michigan, one Standard-Hersey dryer proves that it pays to Standard-ize. Here's what they say about their Standard-Hersey dryer. "What used to be a messy operation is now fully up to high standards expected for a food product. Probably the largest saving is effected in reducing the manpower to operate the equipment—whereas we used to have two men in a shift, a single operator now takes care of our rotary dryers."

Why not let the time-tested Standard-Hersey methods solve your drying problems—and save you money too? There are more than 30 types of Standard-Hersey dryers to suit any need—*anywhere.*

Write today for the free 12 page bulletin on Standard-Hersey Dryers—No. 531.

STANDARD HERSEY Dryers

STANDARD STEEL CORPORATION

5045 Boyle Ave., Los Angeles 58 ★ 7 E. 42nd St., New York 45

For more information, use coupon on page 159.

OPEN THE DOOR...

to more frozen food sales with HURON MSG!

● Things happen when you add Huron MSG to foods before freezing—things important to you as a food processor and attractive to frozen food buyers.

Naturally, you can expect enhanced pure food flavors from Huron MSG, America's original monosodium glutamate made from wheat protein. But you also get unexpected bonuses: retention of original taste and quality levels far beyond usual storage periods, and improved color and texture. What's more, the flavor of many foods actually improves *during* storage when treated with Huron MSG. Such as:

FISH . . . salmon, shrimp, mackerel, haddock and rose fish gain in flavor and all-around palatability. In many cases their original color remains true throughout storage.

MEAT . . . beef, pork sausage, bacon and ham acquire heightened flavor, retain their prefreezing quality longer.

POULTRY . . . all fowl have improved flavor and added juiciness, as well as lengthened storage life.

VEGETABLES . . . most vegetables are given a new full sweetness of flavor. Green vegetables retain color throughout storage and in cooking.

Our Technical Service Department will be glad to furnish you with the cold facts about the best way of using Huron MSG to make your frozen foods taste better, last longer in storage—*and sell faster*. Write or phone—no obligation, of course.

Huron **MSG**

Pure Monosodium Glutamate 99+%

THE FIRST MSG . . . AND THE FINEST!

THE HURON MILLING COMPANY · 9 PARK PLACE, N. Y. C. 7

FACTORIES: Harbor Beach, Michigan

SALES OFFICES: 161 E. Grand Avenue, Chicago 11 • 13 E. Eighth Street, Cincinnati 2 • 383 Brannan Street, San Francisco 7

expedited by loading them onto company-designed tilting-type metal racks, set at about a 35-deg. angle. After about 5 min. of draining, retort crates are raised by electric hoist onto pallets for fork-lift truck movement to the labeling machine in the adjoining warehouse.

Before entering the labeler, cans are automatically twisted so that the blank, non-coded ends are packed right-side up in shipping cases. This simple arrangement facilitates the task of inking prices on the cans at retail stores.

Speed of the wrap-around labeler is about 500 cans per min. Jam-ups at the discharge end of the labeler automatically stop the machine. Light beam from photoelectric eyes is interrupted, thus cutting off the motor driving the feed belt.

Labeled cans then continue to a semi-automatic case packer. Here, 2-oz. cans are packed 24 to a case; 4- and 8-oz. cans are packed 12 or 24 to a case.

When switching from one size can to another, the case packer is rolled out of the line and replaced with a standby unit.

End (Resume reading on page 67)

Dairy Ion Exchange

—Continued from page 61

products was a logical development from its work with the older type base exchange materials used in manufacturing modified milks.

The large quantities of lactose employed by the company in manufacturing its products, coupled with the expected shortage in supply of this material during the latter years of World War II, stimulated an interest in developing more efficient methods of recovering lactose from whey. The more recent development of over supply in milk fat has been a stimulus to a search for a new way of using this material.

Bibliography:

1. Otting, Chrysler and Almy; U. S. Patent No. 2,473,493, 1949.

2. Almy and Garrett; U. S. Patent No. 2,477,558, 1949.

3. Otting; U. S. Patent No. 2,490,599, 1949.

4. Chrysler and Almy; U. S. Patent No. 2,503,866, 1950.

5. Wallace; U. S. Patent No. 2,555,211, 1951.

6. Wallace; U. S. Patent No. 2,555,212, 1951.

7. Wallace and James; U. S. Patent No. 2,555,213, 1951.

End (Resume reading on page 62)

Exposes foreign matter and residue!
Resists oils, acids, alkalies!

Globe White Neoprene Rubber Belting installed on leading make conveyor.

EXPOSED: Dust, dirt and other accumulations! Product particles that are left behind!

The snowy whiteness of Globe White Neoprene Belting exposes them all to certain detection, enabling immediate elimination with hot water or live steam. *That's sanitation-plus!*

Known as the do-all conveyor belting of the food industry, for which it was specifically developed, Globe White Neoprene Rubber Belting consists of multiple layers of hard-woven, light duck, molded together with highest grade neoprene rubber between the plies and over the entire surface . . . finished with a 3/64" thick, satin-smooth cover on the carrying side and with a friction surface on the pulley side.

The characteristics of this type of construction are unmatched: Exceptional flexibility; high tensile strength; minimum stretch . . . all extremely advantageous in operations where head and tail pulleys are small, and on machines with limited take-up facilities.

Resistant to oil, grease, acids, alkalies — possessing a satiny smoothness that makes no impression whatsoever on the product conveyed, Globe White Neoprene Rubber Belting is today on the "must" list of numerous food processing and handling concerns.

Standard widths up to 48", in 2-6 plies inclusive, are available. When inquiring, ask also about Globe White Ruff Top Neoprene Incline Belting, Globe Brown Neoprene Belting, with friction surface on both sides, and Globe Brown Kling-Top Neoprene Belting, with non-slip top for incline and decline conveyors.

Write Dept. F11 for free samples, literature and the names of your local distributors.

GLOBE
WOVEN BELTING CO., INC.
KNOWN FOR QUALITY THE WORLD OVER
1400 CLINTON ST., BUFFALO 6, N. Y.

For more information, use coupon on page 159.

NEW PACKAGES & PRODUCTS

New Freezing and Packaging for Burgers

After extensive research, L. B. Darling Co., Inc., Worcester, Mass., has introduced a frozen hamburger product processed and packaged by a new method.

Company states that patties are made only from prime and choice steer beef. Prepared from a special formula, fat content is controlled to give necessary moisture and added flavor with minimum shrinkage when meat is cooked. After preparation, meat is packaged by Cryovac (Dewey & Almy Chemical Co., Cambridge, Mass.) method which has been successfully used for prepackaging smoked, cured and processed meats, and poultry. In this method, hamburgers are placed in a plastic "Cry-O-Rap" bag from which the air is removed by a vacuum pump. Bag is then sealed and given a quick in-and-out dip in hot water of about 200 deg. F., causing bag to shrink around contents like a second skin. It is then ready for freezer storage.

This special control-freezing process, together with the packaging, gives product a skin-tight fit, making it odor-proof, moisture-proof, and virtually air-tight. Packages are clean and dry, no moisture can seep out, and there is no weight loss from dehydration. Thus quality and flavor are protected, meat maintains its color, and better keeping qualities are obtained.

Patties are packaged eight to a pound in a chipboard box with cellophane window for good product visibility.

Initial distribution is being made on the East Coast with national distribution expected soon. Test marketing is also proceeding with other fresh frozen meat products including steak, pork, and lamb.

For Package Data Use Reader Service p. 159

Specialized Packaging

Though a favorite in only certain areas, sale of hogshead cheese is an important one. With modern methods of packaging, stress to eye appeal, and protective packaging, this product, formerly sold mostly in bulk, was losing its product and company identity.

To offset this, Realtreet Foods, New Orleans, working with Tri-State Molding Co., Inc., Henderson, Ky., evolved a merchandising idea that has increased sales over 25 percent.

This increase is the result of putting product in a rigid transparent polystyrene container. Packed in this 2¾x 2¾x5 in. box, cheese forms a good slicing loaf.

In addition, container gives excellent product visibility, attractive appearance, a shatterproof, airtight container for good food preservation, a reusable package, and a container that retailer can stack easily and that is adaptable to self-service areas.

For Package Data Use Reader Service, p. 159

"Stay-Fresh" Pack

To keep its products always at top quality level, Gordon Foods, Inc., Atlanta, Ga., is constantly on the alert to present its line, not only in a most attractive appearance, but in a manner that will guarantee continued consumer acceptance.

One of its latest innovations is the inclusion of "Magic-Pak" in its potato chip pack. Chips are packed in a perforated combination bag made of Celanese acetate film and sulphite paper (Celanese Corp. of America, New York City). In this container is placed a small packet containing a mixture of silica gel and activated carbon which picks up moisture and off-odors. Research tests showed moisture-controlling "Magic-Pak" added 10 to 14 days longer shelf life to packaged potato chips. This was developed by Dr. R. N. Miller of Gordon Foods and is supplied by Mason-Keller Corp., Roseland, N. J.

Another recent feature introduced by Gordon Foods is tab-opener cello-

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SPECIAL GLOSSY WHITE GLASSINES (... HIGHLY GREASE PROOF ... USED AS AN INNER WRAP FOR CHOCOLATE BARS

More than 600 Riegel Papers are now proving their value for many of the nation's best-selling brands. It is the greatest variety of packaging papers available from any one source.

Somewhere among this wide selection you may find a better or more economical paper to protect your product. If we don't have just what you want, we can usually "tailor-make" a new paper to your specifications.

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Riegel

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For more information, use coupon on page 159.

Pocketsize Performance*

*22 in. x 25½ in.

. . . with big equipment accuracy . . . that's Sutton's new

***Whippet* V-80**

Specific Gravity Separator designed especially for small lot operations!

Now for the first time in separating equipment history here is a portable lab-size separator, incorporating all the inherent performance qualities of standard size machines. Now for the first time you can *economically* assay products for accurate "commercial yield" data *before* setting up full-scale processing operations.

There's a lot you'd like to know about Sutton's new *Whippet V-80*. There's a lot we'd like to tell you.

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SUTTON, STEELE & STEELE, INC.

phane bag (Caldwell Ribbon & Tape Co., Atlanta). This is type used on cigarette packages and opens the bag down the side, providing a large opening for user. The company is using this on its smaller heat-sealed cellophane bags of cheese corn snaps, tater sticks, bacon rinds, Bake-N-Crisp, corn chips, popcorn, and salted-in-the-shell peanuts.

For Package Data Use Reader Service, p. 159

Combination Canned Dinner

An egg noodle and tuna dinner, complete in a 15-oz. can, is being marketed under "Star-Kist" label by French Sardine Co., Inc., Terminal Island, Calif.

Contents consist of water, egg noodles, tuna, soybean oil, salt and monosodium glutamate. To serve, merely heat. Suggestions on label also offer ideas for adding variety to the dinner.

Cheese-Flavored Base

A powder-type Bleu cheese flavor base, packed in 100-lb. bags, is being offered by Dell Food Specialties Co., Beloit, Wis., to food and baking industries.

This is a blend of powdered ingredients producing a strong, pungent flavor of Bleu cheese in baked products such as crackers, biscuits, and pies, and in other items such as salad dressing, spaghetti, macaroni, potato and corn chips.

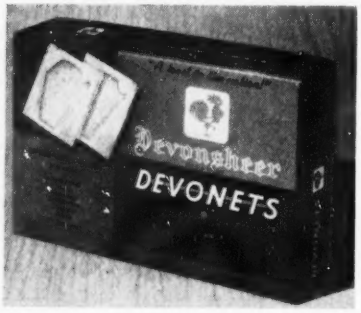
It is reported that product is easy to use and when stored properly, has excellent keeping qualities.

Sauce "a la Chinese"

Well-known as a Chinese specialty, a sweet and pungent sauce is now being commercially marketed in consumer size under tradename "Sparib", by Allied Food Products Sales Co., New York City.

Sauce is made from peaches, apricots, sugar, vinegar, salt, spices, and kumquats. In addition to its use as a barbecue sauce, it is highly recommended as a poultry glaze and as an ingredient for various canapes and appetizers.

Packed in 10-oz. jars, it is being sold in the New York area with national distribution planned in the near future.



"Fill-'em" Canapes

Indented wafers that present an attractive and appetizing appearance when filled, are proving popular with the cocktail set.

One of the favorites is "Devonets", marketed by Devonsheer Melba Corp., West New York, N. Y.

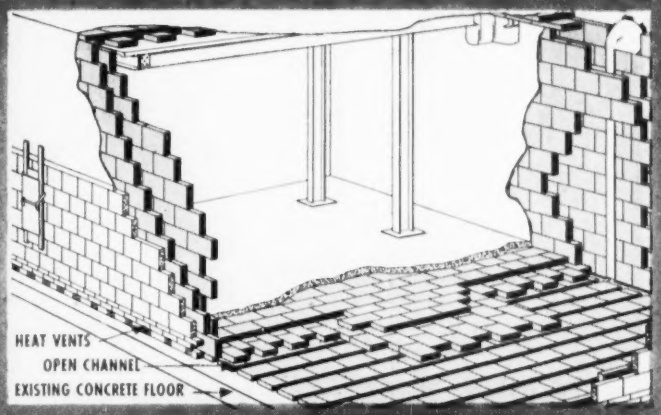
These crisp, toasted canape wafers are approximately 1¼x2 in., in size with the indentation in attractive forms, such as cocktail shakers, presenting a distinctive design when filled.

Approximately 38-40 wafers are protectively nestled within a corrugated paper liner and packed in an attractively designed 3½ oz. chipboard box.

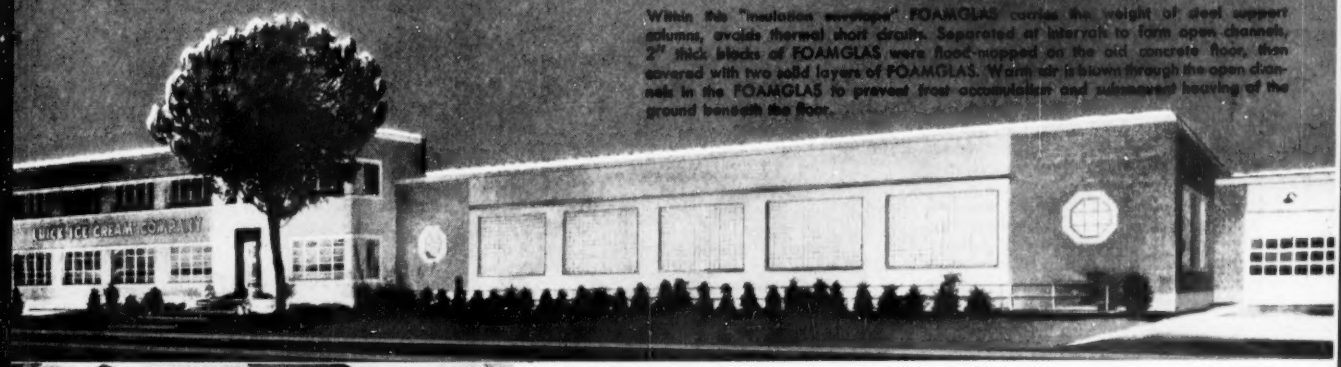
FOAMGLAS®

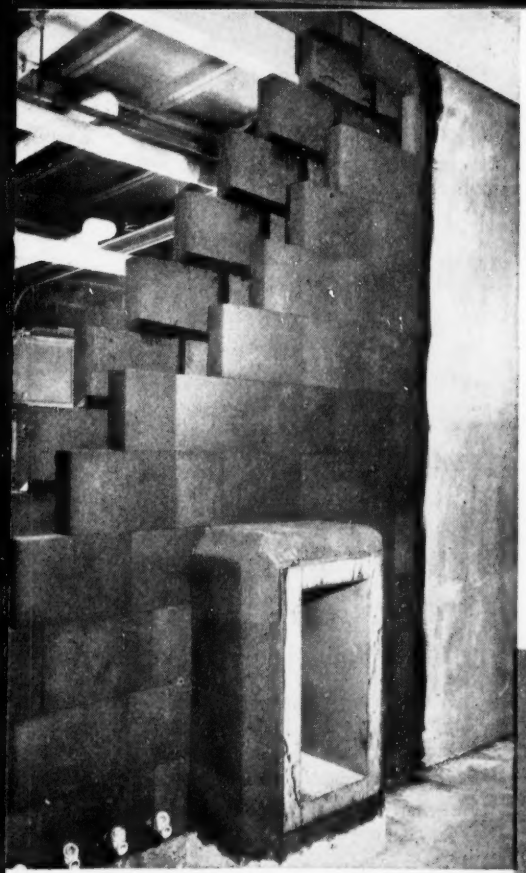
carries the load for Luick

...cuts construction costs, gives constant insulation efficiency



Within this "insulation envelope" FOAMGLAS carries the weight of steel support columns, avoids thermal short circuits. Separated at intervals to form open channels, 2" thick blocks of FOAMGLAS were floor-mopped on the old concrete floor, then covered with two solid layers of FOAMGLAS. Warm air is blown through the open channels in the FOAMGLAS to prevent frost accumulation and subsequent heaving of the ground beneath the floor.





The walls are composed of concrete blocks and two layers of 4" thick FOAMGLAS to provide maximum insulation effectiveness.

General Contractor: Dahlman Construction Co., Milwaukee

Insulation Contractor: Sprinkman Sons Construction Co., Milwaukee

When Luick Ice Cream Co. (Milwaukee Div. of National Dairy) constructed a new ice cream hardening room to handle increased business, they used FOAMGLAS, the rigid, cellular glass insulation, for walls, floor and ceiling. Luick found:

The exceptional compressive strength of FOAMGLAS, able to bear the weight of a concrete floor and roof supporting columns, allowed them to construct their new hardening room *within* the existing plant structure by installing FOAMGLAS directly on the old floor. This construction method saved them two months time and the cost of floor excavation or additional exterior construction.

Luick used FOAMGLAS also because it provides the constant insulating efficiency they need to maintain an unvarying —20° F. temperature within the hardening room. It also maintains a constant *U* factor, resists moisture, is non-combustible and vermin-proof.

You, like Luick, can take advantage of these outstanding FOAMGLAS characteristics to solve *your* insulating problem. Use the coupon now to obtain full information and a free sample of this remarkable cellular glass insulation.

PITTSBURGH CORNING CORPORATION

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NEW!

JUST OFF THE PRESS

24 page booklet on FOAMGLAS for refrigerated structures

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Please send me the following:

- ☐ Your brand new booklet describing uses of FOAMGLAS for insulating walls, ceilings, floors in low temperature space.
- ☐ Free sample of FOAMGLAS
- ☐ Engineer to help with specific problem
- ☐ Booklet on FOAMGLAS for normal temperature buildings
- ☐ Booklet on FOAMGLAS for piping and equipment

Name_____ Title_____

Company_____

Address_____

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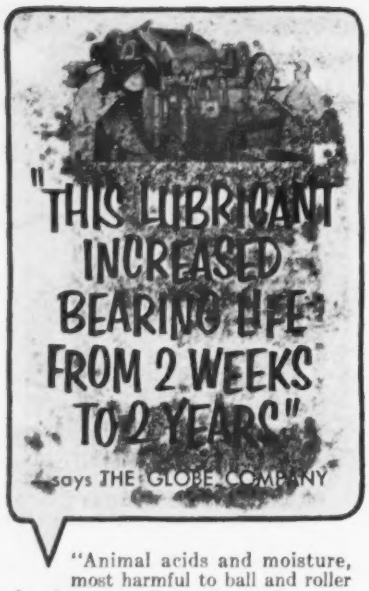


"Animal acids and moisture, most harmful to ball and roller bearings prevails in the entire meat packing industry. With conventional lubricants, some of the bearings in our Roto-Cut machines did not last two weeks. Since using Ball Bearing LUBRIPLATE in machines operating continuously 24 hours a day for over two years, we have not had a single bearing replacement."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK"... a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.

Combination Spread

A peanut butter and bacon spread, packaged in an 8-oz. sausage-like tube of transparent plastic film is being marketed by Oscar Mayer & Co., Chicago.

The spread is a blend of peanut butter, smoked bacon, hydrogenated peanut oil, and dextrose. It should be kept refrigerated.

Educational Promotion

Diet, vitamin, and calorie conscious persons are aware of the benefits of various types of foods. But, to initiate the uninformed, Kreschmer Corp., Carrolton, Mich., is using a method that not only gives them dietetic facts but introduces them to a healthful cereal food.

To do this, sample packages of wheat germ, weighing approximately ½ oz. are being distributed throughout the United States in a heat-sealed cellophane packet, designed and supplied by Milprint, Inc., Milwaukee.

On the back of sample package a full size jar of product is illustrated, and there is also a serving illustration. Vitamin content of one ounce of product is listed. Each sample package contains enough for a generous portion of wheat germ for use on cereal or with some other food.

For Package Data Use Reader Service p. 159.

Iced Tea In a Jiffy

A concentrated liquid for quick preparation of iced tea is now being offered by Seeman Brothers, Inc., New York City, under its "White Rose" label.

Concentrate, made of Orange Pekoe and Pekoe teas, pure cane sugar, and water, is bottled in 8-oz. and 16-oz. sizes. It has a uniformly clear color, no sediment, and blends quickly and easily with added water. Being slightly sweetened, no extra ingredients except iced water (and lemon if desired) are needed. And, as no refrigeration is necessary, this should be a handy item to carry on trips and picnics.

It is stated that this may also be used for making hot tea by merely adding about a tablespoon to a cup of hot water.

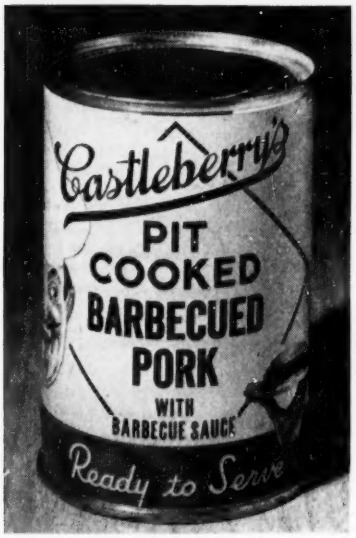
A Good Mixer!

Durkee Famous Foods, Berkeley, Calif., has added a tossed salad dressing to its present line. Introduced on the West Coast, plans for eventual distribution throughout the country are anticipated.

New dressing is a blend of flavors made especially for use in tossed salads. It is said ingredients remain well-blended after being shaken so that they do not separate on the salad.

Product is attractively packaged in bottles with metal lithographed closures specially designed and supplied by Owens-Illinois Glass Co., Toledo, O. Labels are by Lehman Printing & Lithograph Co., San Francisco.

For Package Data Use Reader Service, p. 159



Southern Barbecue

Real Southern, pit-cooked, barbecued pork, is now available in 10½-oz. cans. Packed by Castleberry's Food Co., Augusta, Ga., contents consist of chopped barbecued pork with a barbecue sauce made of water, tomato puree, vinegar, salt, Worcestershire sauce, spices, sugar and flavoring.

Ready to serve, except for heating, product gives consumer the "makings" for tasty barbecue sandwiches.

Variety of Sizes Offered

Continental Can Co., Inc., New York City, is now offering a line of varied sized cans to the frozen food packer.

Its 10-oz. size is being used by packers for the standard small serving for a variety of frozen foods. A. L. Ruso, Inc., Watsonville, Calif., has adopted it for sliced, frozen strawberries.

Among companies using the 16-oz., family-size can is Snow Crop Div., Clinton Foods, Inc., New York City, to pack its frozen strawberries.

Abraham Lustig, Inc., Brockport, N. Y., is using Continental's large 20-oz., pie-size can to pack its Nifty Foods red sour pitted cherries.

how do YOU pronounce
HINDE & DAUCH

HINDE rhymes with FIND
DAUCH is pronounced DOWK

Say HIND and DOWK
America's Authority on Packaging.

our 65th year
H&D®

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HINDE & DAUCH

SANDUSKY, OHIO

17 MILLS AND FACTORIES • 40 SALES OFFICES

For more information, use coupon on page 159

SAUCE WITH A FLAIR

... is made with

SPICEOLATE® SPAGHETTI SAUCE FLAVOR!

That extra-special 'something' that makes a product outstanding! This is what D&O Spiceolate Flavor gives to Spaghetti Sauce . . . a tantalizing taste superiority. Made from pure natural oils and oleoresins, Spiceolate Spaghetti Sauce is a water-soluble compound which distributes its superb flavoring qualities uniformly throughout the product. Manufacturers with private formulas or special flavoring problems are invited to test a batch of Spaghetti Sauce flavored with a "custom-made" Spiceolate compound. Your D&O representative will gladly supply specific details and a copy of the Spiceolate Brochure.

OUR 154th YEAR OF SERVICE

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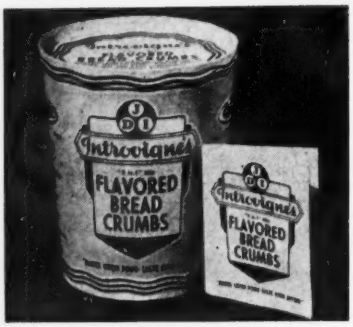
ESSENTIAL OILS • AROMATIC CHEMICALS • PERFUME BASES • FLAVOR BASES • VANILLA



Flavored Breading

Delicately flavored bread crumbs are now being packaged by D. J. Introvigne & Son, Inc., West Springfield, Mass.

Product is packed in 9-oz. round paperboard (Continental Can Co., Inc., Newark, N. J.) containers. Stapled to top of each carton is a folder containing a variety of interesting recipes.

Called "5 in 1" mix, these crumbs contain a special blending of spices, herbs, grated cheese, and condiments. Used as a stuffing, for breading or in casserole dishes, flavored crumbs impart a unique flavor to food.

—End—

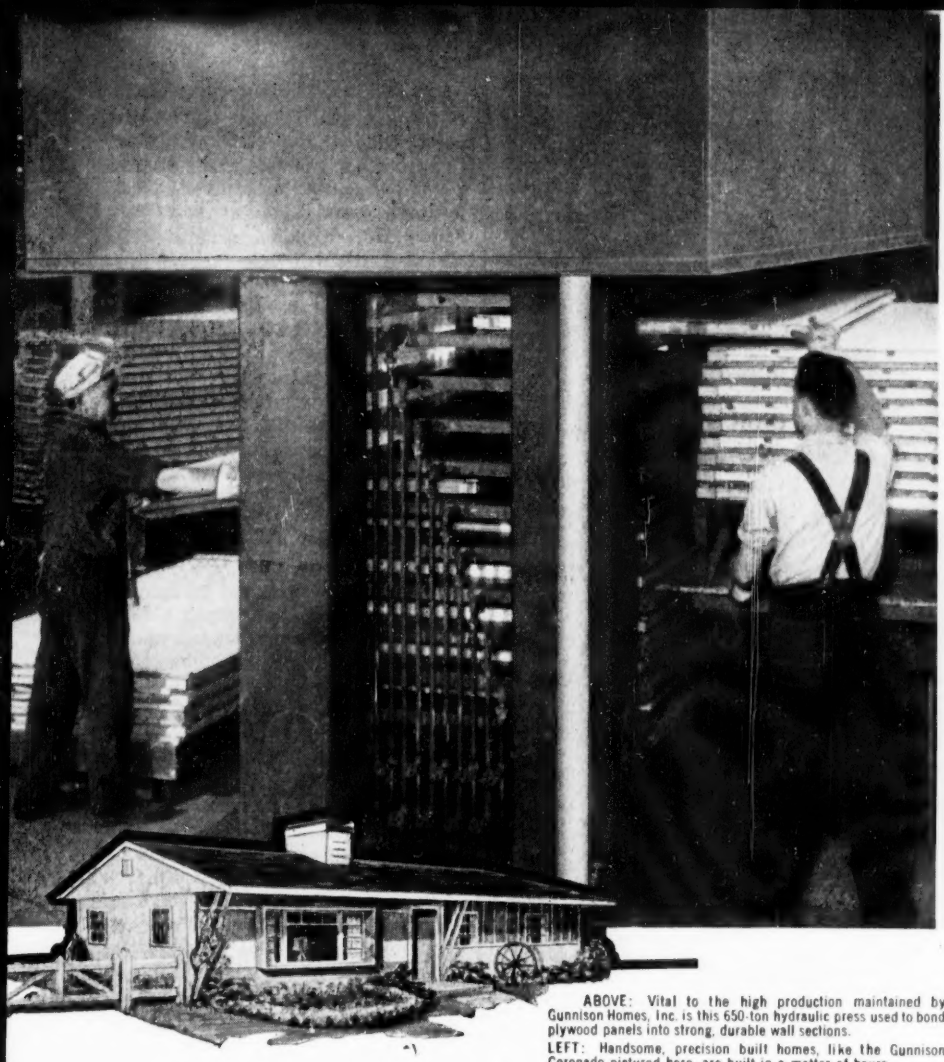
Case-Handling Automated

—Continued from page 70

holds back the flow of cases. When in proper position, the bar is depressed and a second case moves into the unit on top of the first. When the fifth case enters the unit, the stop bar terminates the flow until the stack of cases is discharged on the chain conveyor and the hydraulic elevator has returned to the top position, ready to accept another case. Stacks from unit X move directly along the main-line conveyor.

A stack from unit Y is lowered upon a short chain conveyor, which moves it in position in front of an air-operated ram. Here it closes a switch that actuates a ram and, at the same time, raises an air-operated plate and a stop-bar in the main line. The plate rises to the level of both the short chain conveyor and the main-line and the ram pushes the stack across the plate between guides, onto the main conveyor. The ram withdraws, the plate lowers and, with the stack from unit Y now safely moving on the main line, the stop-bar is depressed, and stacks from unit X may now move along the line.

This main-line chain floor-conveyor



ABOVE: Vital to the high production maintained by Gunnison Homes, Inc. is this 650-ton hydraulic press used to bond plywood panels into strong, durable wall sections.

LEFT: Handsome, precision built homes, like the Gunnison Coronado pictured here, are built in a matter of hours.

Answers a pressing need for Gunnison Homes, Inc....

● Gunnison Homes, Inc., situated in New Albany, Indiana, is one of the leaders in the field of manufactured homes. Key to continuous production of precision built homes at the New Albany plant is the 650-ton hydraulic press, shown above, which was installed in 1947. This press processes ten plywood panels every cycle by the combination of heat and pressure . . . a tough job and one requiring reliable hydraulic performance to maintain production schedules.

STANOIL Industrial Oil was installed in the press when it was put into operation six years ago. STANOIL has stood the test of severe operation . . . with no evidence of oil deterioration being found during a recent inspection of the hydraulic system. Operation has been efficient. Minimum make-up oil has been needed to maintain the oil capacity of 450 gallons.

STANOIL
TRADE MARK
Industrial Oil

Find how STANOIL can benefit you by discussing this multi-purpose oil with a Standard lubrication specialist. You can contact him by phoning your local Standard Oil office. Or, write: Standard Oil Company, 910 S. Michigan Ave., Chicago 80, Ill.

What's YOUR problem?

Ralph E. Murnahan, of Standard Oil's Evansville office, is the lubrication specialist who keeps in constant contact with Gunnison Homes to make certain that there is no interruption of operation due to lubrication difficulties.

He is one of many lubrication specialists who make their headquarters in Standard's offices throughout the Midwest. These men have been specially trained in Standard's Lubrication Engineering Schools and, in addition, have a wealth of on-the-job experience.

To obtain the service of the lubrication specialist in your area, you need only call your local Standard Oil office. The lubrication specialist will discuss your lubrication problems with you . . . at no obligation to you, of course. He has a complete line of petroleum products to offer you, including:

SUPERLA Greases—Available in a wide range of consistency grades and in both lime-soap and soda-soap types. SUPERLA Greases cover a wide range of operations. These efficient products are comparable in quality with the highest type of special greases.

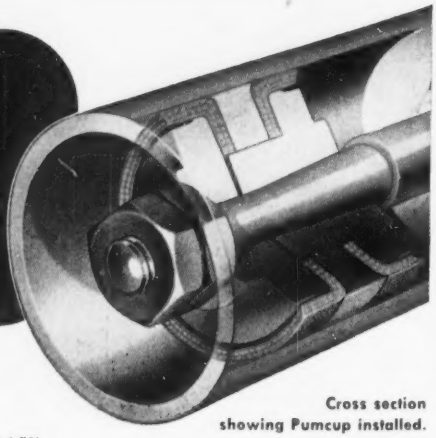
STANOLITH Greases—Because these unique lithium soap products possess the heat resistant properties of soda-soap greases and the water resistant properties of lime-soap greases, they offer a solution to lubrication problems caused by the presence of both heat and water.

STANDARD OIL COMPANY

STANDARD *(Indiana)*

PRESSURE UP! COSTS DOWN!

Slippage Reduced
in PUMPS
AIR CYLINDERS and
HYDRAULIC CYLINDERS
with
DARCOVA PUMCUPS



Cross section showing Pumcup installed.

NORMAL wear of ordinary packing reduces efficiency to a tremendous degree.

In contrast, Darcova Pumcups actually retain their efficiency . . . and they outlast most other packings at least 3 to 1!

Their scientific construction makes it possible to reach *and hold* peak efficiency. Under pressure Pumcups hug the cylinder walls to provide a uniform seal and exert full pressure where it is needed. This means reduced slippage, lower power costs and far less maintenance.

Write for helpful data-and-proof bulletins: No. 4502 on Pumcups for air and hydraulic mechanisms; No. 4401 on Pumcups for reciprocating pumps.

Cost-minded engineers in many industries have standardized on Pumcups to solve their packing problems. The list of successful applications includes the following installations:

Die casting machines
Forming and drawing presses
Straightening presses
Pipe bending machines
Briquetting machines
Pusher mechanisms
Door control devices
Lifting and dumping devices
Spraying equipment
Proportioning pump regulators
Recoil cylinders
Air booster pumps
Grease guns
Automatic bottling and filling machines
Extrusion presses
Steering mechanisms

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PUMCUPS

is routed past the loading dock used by relay trucks, which haul to other Arden plants. Then the conveyor passes through the refrigerated room (38 deg. F.) and thence to the wholesale truck loading dock. Loading docks are floored with diamond steel plate to eliminate friction when drivers drag stacks, with stack-hooks, from the conveyor into their trucks. Docks are built truck-bed height so no lifting is necessary.

The refrigerated storage room is another reservoir for product not needed for immediate distribution. The conveyor moves stacks directly through the center of this room still at floor level.

Here again, steel flooring aids in handling and sliding the stacks, and the floor-level conveyor in the refrigerated room is estimated to increase stacking space about 25 percent. Only 2,500 sq. ft. is needed, most of the plant's large output going directly to relay or wholesale trucks.

In the last step of the operation, stacks which move through the refrigerated room on the conveyor go to a 380-ft. loading dock for the fleet of 72 wholesale route trucks.

Arden's automatic loading system has worked so well that the company plans such installations in other plants.

P.S.: A stacker that receives cases at floor level and builds the stack from the bottom up also has been developed by FMC. This permits automatic stacking to be fitted into any production layout with minimum changeover.

End (*Resume reading on page 70*)

Continuous Oven Control

—*Continued from page 63*

Because of the above qualities, the D.A.T. control fits in nicely with the pattern of baking at Schaible's. The versatile "traveler" is continuously used to bake such items as sandwich buns, variety breads, and sweet rolls of various weights and sizes. As a result it is necessary to re-set the control point at frequent intervals for temperatures anywhere between 350 and 450 deg. F. In practice the electronic control responds so quickly that the oven comes to its new temperature in 10 min. or less.

Eliminates "Wiggles"

Schaible's is experiencing much greater temperature uniformity across the trays and an almost complete removal of "wiggling" or cycling effect.

Much of this improvement is attributed to more even temperatures across the combustion space of the

oven. Because the on and off times are continuously alternated, it is not possible for hot spots to build up in the middle of this area.

The baked goods give evidence that very narrow gradients are being held across the trays. Crust color and final percent rise are uniform no matter where the bread or roll doughs are placed—in the center or on either side of the traveling tray.

However, this unusual uniformity is also due in some measure to expert re-adjustment of the baffles in the downcomers of the oven, which are placed to provide optimum heat distribution.

In great measure, the lowered gradients across the tray are due to the length of the thermolm detector tube. Extending 36 in., it reaches well toward the center of the oven to provide an average or median reading as the basis for burner operating ratio. Thus, there is never a scarcity or excess of heat input.

Another improvement affected by the new control system is a generally lowered stack temperature and resultant fuel savings—indicative again of the improved heat distribution along the top and bottom trays.

Flash Heat Licked

Under conventional on-off control, Schaible's experienced a violent cycling of temperature during start-ups and changes.

When the first batch of goods was loaded in the morning, temperature would drop because the dough "sucked" large amounts of heat. The differing moisture contents of various goods would also cause severe fluctuations at other times. Because the oil burner stayed full-on until temperature reached the control point, an overshoot would occur, followed by erratic cycles. Usually, the first goods were underbaked; those immediately following overbaked.

Automatic reset and rate action in the D.A.T. deal with this situation. The former action brings the average temperature back to the control point and prevents offset due to the heat demands of fresh or different batches. Rate action, on the other hand, "heads off" the temperature change as soon as it starts and speeds up the recovery of the system without tendency to overshoot or cycle.

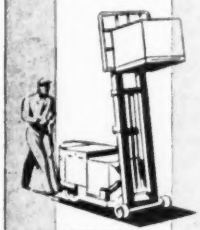
Recent checks reveal that oven temperatures at Schaible's are being held consistently to within plus-or-minus 1.0 deg. F. And the evenly baked goods—exceptionally uniform in crust color and precent rise—testify that the problem of flash heat is being eliminated.

End (Resume reading on page 64)

Hedrich-Blessing Photograph, courtesy of the EDWARD HINES LUMBER CO.

CLARK Electric Fork Trucks

CLARK Attachments



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The Vital Story of WHITE FLOUR ENRICHMENT

by Science Writer

The blessings of better health and increased vigor are in store for many Canadians as a result of the start of flour enrichment by Canadian millers. Dramatic results in improving public health through the use of enrichment have been shown by experience in the United States, the Bataan peninsula in the Philippines, and Newfoundland. The benefits have been so outstanding in these and other nations that more and more countries are adopting enrichment.

1953 sees the enrichment of white flour put into practice throughout Canada. This program became possible through the recent amendment of the Food and Drugs Act.

Everyone in the milling industry knows that the great majority of Canadians, like other North Americans, want beautifully fine, white flour. When wheat is milled and processed to get this white flour which the public demands, vitamin and mineral values are unavoidably lost. The loss of essential vitamin and mineral elements is easily overcome by enrichment.

The enrichment of ordinary white flour is simple and inexpensive. It restores these vital vitamin and mineral factors to milled white flour: thiamine, riboflavin, niacin and iron. Calcium also may be added as an optional ingredient. Canadian specifications also provide for enrichment of higher extraction flour (Vitamin B White Flour, Canada Approved).

Technology is so advanced these days that scientists are able to "build" duplicates of many of Nature's essential complexes in the laboratory. This has happened with many vitamins. First, the chemical composition is learned and the pure substance is isolated. Then a "duplicate" is made which is identical with Nature's product chemically and in biological activity. A vitamin is a vitamin regardless of its source, just as salt is salt whether it comes from a mine or is evaporated from the sea. So efficient is large scale manufacturing that vitamins are sold at a lower cost than if they were extracted from natural sources.

These are the vitamin and mineral factors which are used in white flour enrichment:

Thiamine—also called vitamin B_1. This vitamin helps to build physical and mental health. It is essential for normal appetite, intestinal activity and sound nerves.

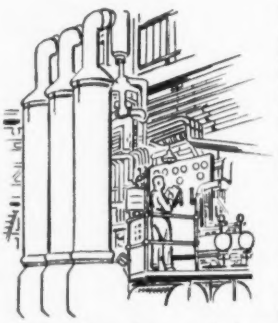
Riboflavin—also called vitamin B_2. This vitamin helps to keep body tissues healthy and to maintain proper function of the eyes. It is essential to growth.

Niacin—another "B" vitamin, is needed for healthy body tissues. Its use in diet is effective in controlling the serious disease, pellagra.

Iron—is the mineral used in enrichment. It is essential for making good red blood and preventing nutritional anemia.

To meet the amended regulations of the Canadian Food and Drugs Act, each pound of *enriched flour* must contain:

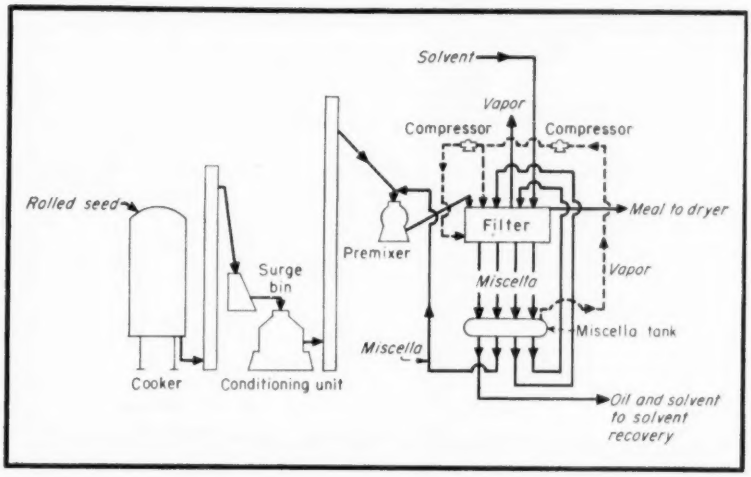
	Not less than	*Not more than*
Thiamine	2.0 milligrams	2.5 milligrams
Riboflavin	1.2 milligrams	1.5 milligrams
Niacin or Niacinamide	16.0 milligrams	20.0 milligrams
Iron	13.0 milligrams	16.5 milligrams



The Hoffmann-La Roche people manufacture top quality vitamins literally by the tons. To do this they must use amazingly complex processes with scientific production controls and the latest equipment which fill a building a city block square and many stories high. The flour-enriching ingredients are later combined in a form called premix which flour millers add to flour manufacture so that the enrichment is spread evenly throughout the flour.

This article, reprints of which are available without charge, is published as a service to the milling industry by the Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 286 St. Paul Street, West, Montreal, Quebec.

ADVANCES IN TECHNOLOGY



New Process for Extracting Oil From Cottonseeds Seen Applicable to Many Other Food Products

A filtration-extraction process for cottonseed that removes from 2½-5 percent more oil than conventional pressing methods and yields a product comparable with solvent extraction, yet uses less solvent, power, and labor, has been developed at SRRL. Several commercial installations are now under construction with operations slated for this summer.

In process, rolled cottonseed meats are cooked at 230 F., cooled and slurried with miscella in a premixer where practically all of the oil goes into solution (see drawing above).

Slurry is then sent to a horizontal filter where strong miscella, containing 25-35 percent oil by weight, is separated from meal by washing. First and second washes are with weak miscella. Final wash is with hexane.

Oil is removed from miscella by conventional method. Solvent-damp extracted meal is discharged from filter by motor-driven scroll and dried.

Due to much smaller investment in equipment for this process than is required for prepressing plus solvent extraction, greatest application is seen in plants handling less than 200 tons per day. Its economy, however, suggests future use in larger installations.

Since process is based on pre-solution followed by countercurrent washing, it should be applicable to extraction of any soluble component from a solid.

Digest from "Better Solvent Extraction," *Chemical Engineering*, 124-28, May, 1953.

Hydrogenation Makes Palm Oil Suitable For Food Products

Palm oil may be converted by hydrogenation into a product with wide applications in food manufacture.

Its natural deficiencies can be partly remedied by refining, but best results are obtained by selective hydrogenation. This process will saturate carotenoid pigments and fatty acids with several double bonds, at same time excluding transformation of oleic into stearic acid. Product will be decolorized, stable, and adaptable to plastification and emulsification. It will contain about 12 percent iso-oleic acid.

Satisfactory catalysts can be obtained by the decomposition of nickel formate. Both wet and dry methods have been used, but latter yields a superior product. By this method, nickel formate is decomposed at 250 C. in a stream of hydrogen. Resulting catalyst is considerably less active than that formed by wet method, but its selectivity is higher.

Hydrogenated palm oil is acceptable in margarine industry. It may be used also in preparation of cooking fats, particularly desirable in making puff pastry. It may also be aerated with air or nitrogen at instant of plastification, producing a creamy product readily incorporated with flour and enabling dough to rise uniformly during baking.

Digest from "Hydrogenated Palm Oil in Food Manufacture," by M. Loury and J. Jorand, *Food Manufacture*, (Pub. 9 Eden St., London.) 28, 107-108, March, 1953.

CONFECTIONERY

Controlling Fat Bloom

Chocolate goods should have their cocoa-fat crystallized in stable beta-modification if fat bloom is to be avoided.

This requires tempering at 80-82 F., with care being taken to avoid undercooling—especially below 70 F. when unstable crystals of alpha-modification will appear. Correctly tempered chocolate will resist bloom for a long time unless storage temperature exceeds 91-95 F.

Cocoa butter shows its greatest contraction in the beta-form, a property of importance in molding since pieces thereby tend to shrink away from molds. An effective means of avoiding bloom is addition of 4-5 percent hardened peanut oil or hydrogenated shortening.

No production problems arise

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through such additions and several varieties of bars—coated nuts, marzipan, and nougats—on which such coatings were used showed no bloom after 15 months storage at alternating day temperatures of 78-82 F., and night temperatures of 64-68 F. No greasiness or sticking to wrappers appeared during tests. The hardened fats used should not contain cocoanut or palm kernel oils, since these saponify after short storage in contact with cream or moisture-bearing centers.

Digest from "Chocolate Production and Fat Bloom," by J. Kleinert, *International Chocolate Review*, 3, 72-76, 1953. (in German).

DAIRY

Fortified Cheese Wheys Support Yeast Growth

Yeasts, or yeast-like microorganisms can utilize cheese whey solids as food, and of four tried, *Torula cremoris* grew satisfactorily in acrated cultures.

Supplementary nutrients such as urea or ammonium salts stimulated growth. Optimum temperature was found to be 25-30 C., and optimum pH 4.4.

In pilot plant tests, *T. cremoris* was grown in 50-liter lots. After 24-48 hr. fermentation lactose was completely used up and whey-yeast mixture was dried on an atmospheric drum drier. It yielded a nonhygroscopic powder containing 35.6-40.2 percent protein, 27 percent ash, 17-20 percent fat, 10-12.5 mcg. riboflavin per 100g., and 1.30-1.10 mg. thiamine per 100g.

Digest from "Increasing the Food Value of Whey by Yeast Fermentation. I. Preliminary Studies on the Suitability of Various Yeasts," by V. E. Graham, D. L. Gibson, H. W. Klemmer, and J. M. Naylor, *Canadian Journal of Technology*, Vol. 31, Nos. 4 and 5, 85-9; "II. Investigations with Small-Scale Laboratory Fermenters," by V. E. Graham, D. L. Gibson, and H. W. Klemmer, *Ibid.* 92-97; "III. Pilot Plant Studies," by V. E. Graham, D. L. Gibson, and W. C. Lawton, *Ibid.* 109-13, 1953.

BAKING

Crust Formation in Baking Speeds Bread Staling

Migration of moisture to crust is an important factor in staling of bread crumb. However, a large increase in firmness of crumb during the first 2 days after baking occurs equally with crust and crustless loaves. This development, detected by physical tests, is not noticeable by sensory perception.

Sponge-dough process bread was divided into 2 groups after baking.

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- to pack or store your product safe from moisture damage
- to get exact moisture control for the precise atmosphere condition you need
- to provide precise atmospheric conditions for testing
- to increase your air conditioning capacity
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The Niagara's Controlled Humidity Method using HYGROL moisture-absorbent liquid is

Best and most effective because . . . it removes moisture as a separate function from cooling or heating and so gives a precise result constantly and always. Niagara machines using liquid contact means of drying air have given over 20 years of service.

Most reliable because . . . the absorbent is continuously reconcentrated automatically. No moisture-sensitive instruments are required to control your conditions.

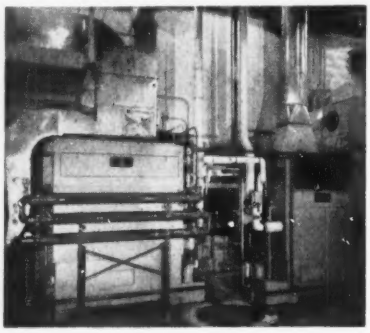
Most flexible because . . . you can obtain any condition at will and hold it as long as you wish in either continuous production, testing or storage.

Easiest to take care of because . . . the apparatus is simple, parts are accessible, controls are trustworthy.

Most compact, taking less space for installation.

Inexpensive to operate because . . . no re-heat is needed to obtain the relative humidity you wish in normal temperature ranges and frequently no refrigeration is used to remove moisture.

The cleanest because . . . no solids, salts or solutions of solids are used and there are no corrosive or reactive substances.



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Loaves in the first were carefully stripped of their crusts, those in the second group were left intact. Then all were placed in individual heat-sterilized, press-top tinned containers with tight-fitting lids and stored at 75 F.

Physical and sensory tests were made over a period of 140 hr. Data show lack of agreement between the tests in 2 major respects: 1. Physical tests failed to show differences between crumb from intact and crustless loaves in the period from 44-140 hr., whereas sensory perception panel noted an increasing difference in freshness. 2. Panel considered the bread still fresh when the greater part of changes in properties measured by physical tests had already occurred (the first 20 hr.)

Digest from "The Effect of the Crust on the Staling of Bread," by W. G. Bechtel, D. F. Meisner and W. B. Bradley, *Cereal Chemistry*, 160-68, March 1953.

CEREAL PRODUCTS

Preparing Carotene

Separation of carotene from extracts of plant tissues by adsorption requires an adsorbent that is not too expensive, is easily regenerated, adsorbs carotene weakly or not at all, and adsorbs chlorophyll and xanthophylls strongly.

While calcium hydroxide and activated carbon have been used for the purpose, trials with a number of alkali and alkaline earth compounds indicated that tricalcium phosphate was the most nearly like the idea adsorbent. When tried on 5-6 gal. batches of alfalfa extract obtained by extracting 12 lb. alfalfa meal with Skellysolve B, both simple stirring and filtration, as well as the "chromatofuge" of Hopf (Ind. and Eng. Chem. 39,938(1947)) were used. The latter is essentially a slow speed basket-type centrifuge 2 ft. in dia., in which the adsorbent is held against a filter-paper backing in an annular, peripheral ring, and the solution to be chromatographed is admitted at the center of the basket.

Under the mild centrifugal forces set up by rotation at 200 rpm., the solution traverses the adsorbent taking the carotene with it and leaving the useless pigments behind.

Extract from 20-25 lb. of alfalfa meal could be put through 14 lb. of tricalcium phosphate before its capacity to adsorb chlorophyll was exhausted. Elution of the pigments required 5-7 gal. of 5 percent isopropyl alcohol in Skellysolve B, followed by several gal. of pure solvent.

This may amaze you!

...and it will surely *help* you: FOOD ENGINEERING's most important issue in 25 years!

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Your eyes will be opened wide by the profit-boosting, cost-cutting possibilities you may have missed in the past . . . by the future possibilities *you can't afford to miss* . . . as you read *'Twenty-Eight to 'Seventy-Eight.*

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Starting with 1928—the year FE was founded—our editors will show you the important advances in each unit operation listed at right. Then, on the basis of today's soundest trends, they will project these advances into the next 25 years.

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'TWENTY-EIGHT to 'SEVENTY-EIGHT

Partial List of Subjects

Cleaning Raw Materials
Separating
Disintegrating
Proportioning
Mixing
Forming
Coating
Heat Transfer
Moisture Removal
Packaging Mtls. & Equip't.
Waste Disposal
Materials Handling
Air-Conditioning
Automatic Process Control
Quality Control
Sanitation

Economics of Technical Progress — A special section devoted to economic and business factors in food-industry progress; how equipment must pay for itself; how modernization funds are raised; etc.

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OCTOBER 1953

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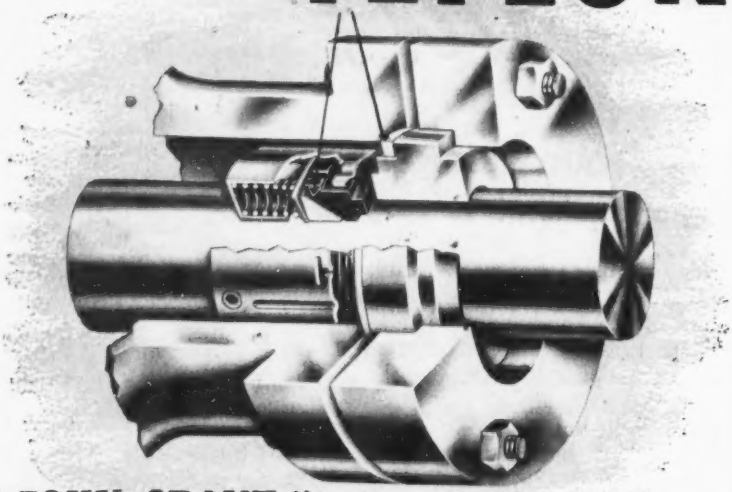

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One packing of the chromatofuge sufficed for extraction of carotene from about 100 lb. of alfalfa. About 95 percent of the carotene in the extracts was recovered by the tricalcium phosphate adsorption.

Digest from "Preparation of Carotene Concentrates from Dehydrated Alfalfa Meal," by H. L. Mitchell, W. G. Shrenk, and R. E. Silker, *Industrial & Engineering Chemistry*, 415-17, Feb. 1953.

Heating Whole Wheat Base Solves Storage Problem

By heat-treating that part of the wheat kernel usually removed in milling of white flour—bran, germ, shorts—this mixture can be stored satisfactorily for at least a year at 100 F., and for twice that period at room temperature.

This heat-stabilized base can be recombined with white flour to produce whole wheat flour as needed. Bakery products from such flour are similar to those from original whole wheat flour. Loss of thiamine in the base is compensated by use of enriched white flour.

A mixture of bran, germ, and shorts in ratio approximating that prevailing in the milling of white flour, was dampened with one part water to four of mix and heat-processed for 1½-2 hr. under 12-15 lb. steam pressure. Mixture was then dried at 200 F. to a moisture content of 8 percent or less. It was then ground to suitable size for baking, blended with an equal quantity of white flour and made into bread, rolls, griddle cakes, muffins, and apple crisp. When compared with similar products made from a whole-wheat flour, by a panel of 30 testers, no differences were found.

Although this investigation was made by the Armed Forces with a view to providing whole wheat bread to troops in the field, advantages are applicable to other conditions where it is difficult, if not impossible, to serve palatable whole wheat bread.

Digest from "Heat Stabilized Wheat Base," by Joseph Cryns, Doris Calloway, Marion Bollman, and R. A. Larsen, *Transactions of the AACC*, Vol. 11, 5-12, Feb., 1953.

MEATS

Antioxidant Containing Coating Protects Frozen Poultry

Susceptibility of frozen poultry to fat oxidation can be greatly decreased by applying antioxidant-bearing coating to its surface before storage.

Half turkeys, prepared by slitting eviscerated fowls through back and keel, and steaks (⅜-in. thick transverse

(*Turn to page 162*)

Reader Service

For food-plant employees and consultants only . . .

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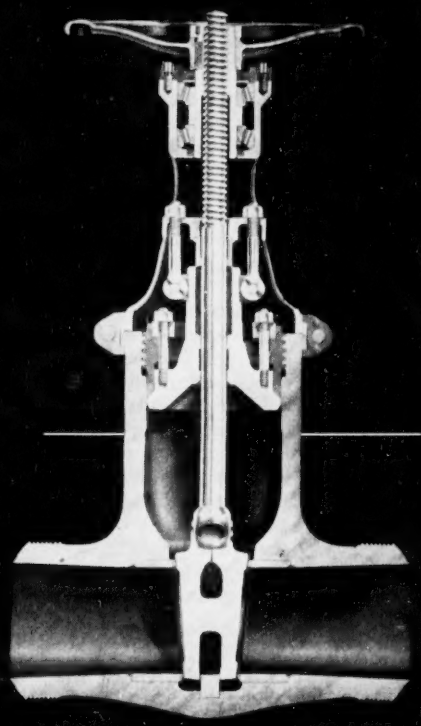
July 1953



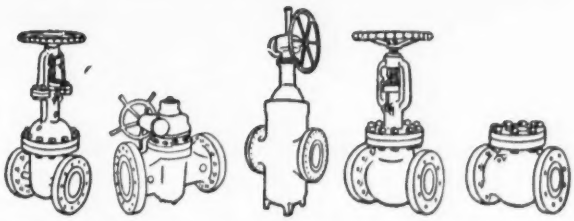
STEEL

COMPLETE LINES OF CAST STEEL VALVES AND PIPE FITTINGS are manufactured by Walworth in a variety of pressure classes, types, sizes, and patterns for general industrial use. Walworth also manufactures cast steel valves for specific service applications.

Walworth produces steel bar stock valves, and cast steel valves made of carbon steel, carbon molybdenum steel, corrosion-resistant, and heat-resistant alloy steels. Included are gate, globe, angle, check, and lubricated plug types. Sizes range from ⅛ to 30 inches; pressures range up to 5,000 psi. Full information is contained in Walworth General Catalog 52, a copy of which will be forwarded if requested on business letterhead.

Walworth also manufactures complete lines of valves and fittings made of bronze, iron, and special alloys as well as steel. Walworth-made valves, fittings, and pipe wrenches total approximately 50,000 items.

Walworth engineers will be glad to help you with your problems. For full information, call your local Walworth distributor, nearest Walworth sales office, or write to Walworth Company, General Offices, 60 East 42nd Street, New York 17, New York.



Illustrated in section is an 8-inch Series 900, Walworth Pressure-Seal Cast Steel Gate Valve designed for high-pressure, high-temperature service. Pressure-Seal Valves are available in Series 600, 900, 1500 and 2500; sizes 1 to 16 inches. Small Cast Steel Valves, Series 1500, in angle and Y-globe types, are also available in sizes ranging from ¼ to 2 inches.

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slices from frozen turkey carcass) were dipped in aqueous solutions containing 3 percent gelatin and various antioxidants.

Coated steaks were sealed in cellophane bags; halves in butcher-wrap, and stored at 10 F. for 6 months. Protection provided by coated as compared with uncoated controls was measured in terms of peroxides in raw fat of skin and meat, and rancid off-flavors and odors in cooked skin and meat.

Steaks coated with gelatin alone had 30 percent less peroxide, 20 percent less off-flavor than controls. When antioxidant (0.1 percent BHA, 0.03 propyl gallate, 0.02 citric acid) was included in coatings, steaks had 80 percent less peroxide, 50 percent less off-flavors than controls.

Gelatin coatings with ¼th of antioxidant used above, provided good protection to half turkeys—70 percent less peroxide, 40 percent less off-flavor than controls.

Digest from "Quality of Cut-Up Frozen Poultry Protected by Antioxidant Coating," *Report of the Chief of the Bureau of Agr. & Ind. Chemistry Agr. Research Adm. USDA*, Washington 30, 1952.

SANITATION

Fumigation of Dates

Methyl bromide penetration into boxes of compressed dates (10 x 11 x 19 in.) is best under sustained vacuum method of fumigation commonly practiced in the U. S. and Canada.

Under atmospheric conditions, penetration factor for centers of boxes was about 30 after a 24-hr. exposure to a nominal concentration of 37 mg. methyl bromide per liter of chamber volume. With the released vacuum method (vacuum released as the fumigant is admitted) the penetration was 32 for a 3-hr. exposure.

Under the sustained vacuum (fumigant admitted with the chamber evacuated to 5-in. Hg or less, vacuum held for 3-3½ hr. before releasing) a penetration factor of 38-45 was reached at the center of the boxes of dates in 3 hr., while factors of 100 or more were often reached in 4-6 hr. Center of the boxes reached essentially nominal concentration of methyl bromide in the fumigation chamber. Release of vacuum after initial holding period with fumigant in the chamber, practically doubles the penetration even under commercial conditions.

Two air washings by evacuating fumigated chamber and releasing vacuum at about ½-hr. intervals, reduced methyl bromide concentration in boxes to about 13 mg./l., compared to about 1.2 mg./l. in the free space.

Solve cooling problems with waste heat or low-cost steam!

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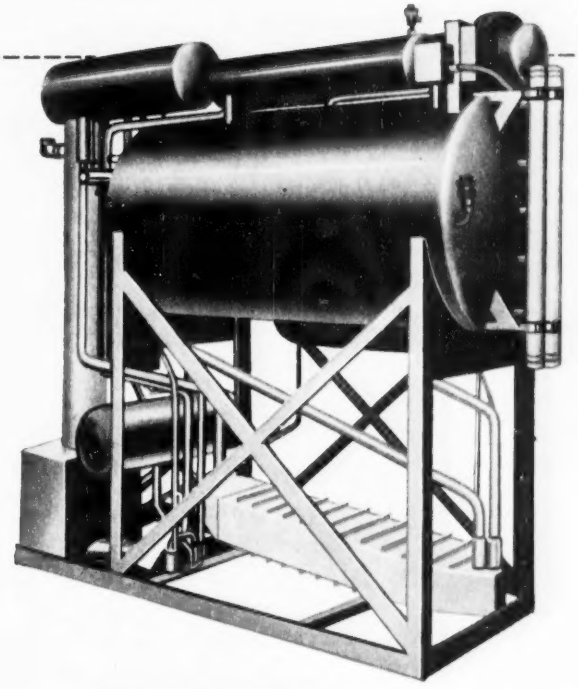
meets <u>all 3</u> cooling needs



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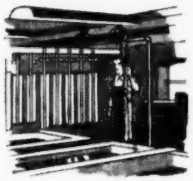
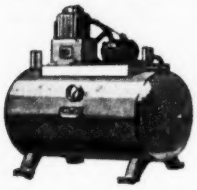


Because it operates with no moving parts on the time-proved absorption refrigeration principle, you can depend upon the Servel 25-ton Water Chiller for continuous high-efficiency cooling of liquids for various manufacturing and formulating processes.

3. INDUSTRIAL PRECOOLING



You can use the unusually flexible Servel 25-ton Water Chiller to precool air for increased capacity and improved performance of air compressors and internal combustion machines. The Water Chiller also serves other money-saving precooling purposes.

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CAUTION

Be sure the food wrapper on your product is

NON-TOXIC

Some food wrappers that supposedly are giving safe protection, may be harmful to the flavor and quality of the food. Even a faint trace of toxicity in a wrapper that comes in direct contact with food can be dangerous.

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You can have utmost confidence in Patapar Vegetable Parchment. This high wet-strength, grease-resisting vegetable parchment is made from 100% pure cellulose. It is odorless, tasteless and absolutely NON-TOXIC. It meets every requirement of the Federal Food and Drug Act.

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Such boxes could continue to release methyl bromide and must therefore be handled with care by workmen.

Digest from "Behaviour of Fumigants During Vacuum Fumigation. I. Penetration of Methyl Bromide into Boxes of Dates," by W. Burns Brown and S. G. Heuser, *Journal of Science of Food & Agriculture*, 48-57, Jan. 1953.

BEVERAGES

Presence of Sorbitol In Wine Is Evidence of Adulteration

Of methods for detecting presence of sorbitol in wines, Litterscheid test seems to be the best, since it gives a larger and more certain precipitation. It depends on formation of whitish-yellow-precipitate of trichloro-benzal-sorbitol on adding orthochlorobenzaldehyde to acidified wine. Precipitate may be dried and weighed.

A grape wine adulterated with 5 percent of other fruit wine will usually give at least 30 mg. precipitate per liter. Nature of precipitate can be confirmed by converting to hexa-acetate of sorbitol which has a melting point of 210 F.

Objections have been raised to test on grounds that wines made from unripe grapes may contain sorbitol naturally. But trial fermentations of juices from such grapes gave no traces of sorbitol by Litterscheid or other tests.

Since sorbitol is produced by reduction of glucose it has also been argued that, when stored in metal tanks, some wines might liberate hydrogen which could reduce glucose to sorbitol. Tests in aluminum and galvanized iron containers of natural wines and others, soured to pH 2.2 with tartaric acid, gave no sorbitol, however. It is, therefore, concluded that presence of sorbitol is evidence of fruit wine admixture.

Digest from "The Detection of Fruit Wines in Wine," by R. G. Eeckhaut, *Fermentatio*, 6, 155-62, 1952.

MISCELLANEOUS

Bacteria Under Olive Skins Blamed for Yeast Spots

"Yeast spots", one of the common blemishes appearing on California pickled olives, are characterized by raised white spots or pimples between the under surface of the skin and flesh.

Olives of Sevillano variety are most prone to "yeast spots" but it has been found on all varieties and types that have undergone fermentation in salt brine. And similar blemishes have been found in packs of Italian peppers and pickled green tomatoes. Yeasts have never been found in the

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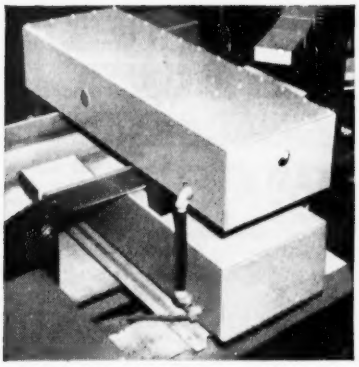

RCA Metal Detector fits around conveyor. Complete inspection provided by this reliable detector prevents stray metal from contaminating your product.

RCA Metal Detector finds stray metal in raw or packaged product

NOW YOU CAN SAFEGUARD product quality completely . . . *automatically* . . . *electronically* . . . *economically*—with an RCA Metal Detector. It will provide 100% inspection—will thoroughly search every ounce of your product during processing or packaging operations. Tramp metal as tiny as a .039" diameter steel sphere will be located by the RCA Metal Detector . . . at conveyor speeds up to 1,000 feet per minute.

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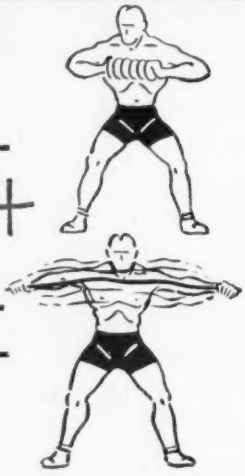

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Food Engineering Reports
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In Keeping Up With Field . . . page 189

spots, but it has been shown by examination of isolates from 25 samples of olives, that they are due to colonies of *Lactobacillus plantarum*, a gram-positive, non-motile, catalase-negative rod.

Preventive measures have not been found, and will probably be very difficult, since bacteria gain entrance through pores or other breaks in the skin of the fruit. Sevillano olives, because of their large stomatal openings, are especially prone to the blemish.

Digest from *"Lactobacillus Plantarum*, The Cause of 'Yeast Spots' on Olives," by Reese H. Vaughn, William D. Won, Francis B. Spencer, Demosthenes Pappagianis, I. Omar Foda, and Paul H. Krumperman, *Journal of Applied Microbiology*, 82-85, Mar. 1953.

Corrosion Inhibitors

Sodium benzoate as a corrosion inhibitor for cooling systems was first announced in 1947 and was found to be effective in ethylene glycol antifreezes by both laboratory and road tests.

At 1.5 percent concentration it is effective for the protection of mild steel, but offers little protection for cast iron. Sodium nitrite is most effective corrosion inhibitor for cast iron, but does not protect soldered brass, a 0.1 percent solution in ethylene glycol being more corrosive to brass than no inhibitor at all. Sodium benzoate 1.5 percent, and sodium nitrite 0.1 percent together in 20 percent ethylene glycol effectively inhibits corrosion of both cast iron, soldered brass, and copper during intermittent heating exposure. A short period of heating at the start of the exposure is required for the best protection of cast iron.

Digest from "Sodium Benzoate and Sodium Nitrite as Corrosion-Inhibitors in Ethylene Glycol Anti-Freeze Solutions. I. Laboratory Investigations" by F. Wormwell and A. D. Mercer, *Journal of Applied Chemistry*, 22-27, Jan. 1953.

—End—

Wire-Belt Conveyors

—Continued from page 92

chuck pulleys, guides, and tighteners —do not meet the needs of the belt or the requirements of the task. For then results will not measure up and belt life will be shortened.

Hence common sense dictates that final determination of belt, conveyor parts, and assembly design be made

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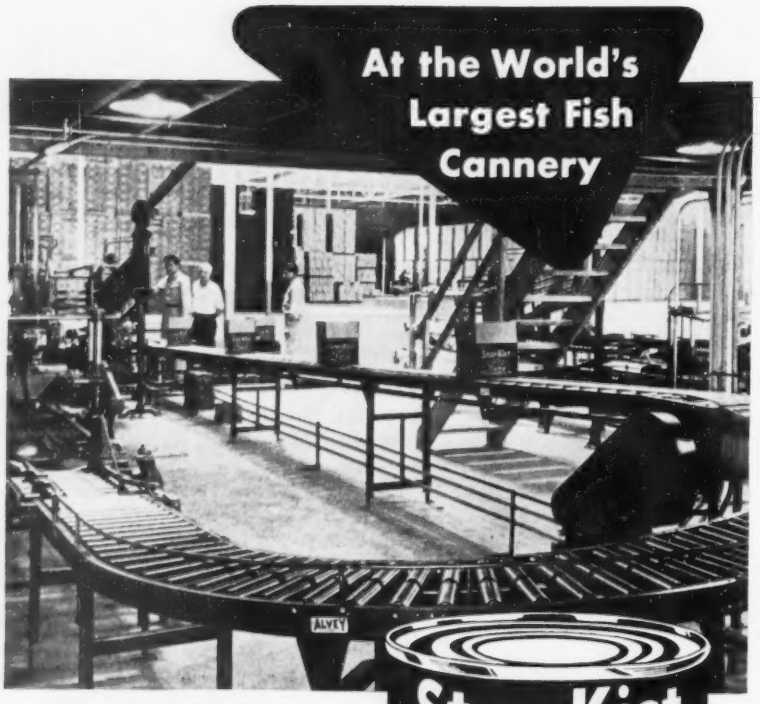

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only after advice of a wire belt engineer or consultant. Especially does this apply to a unit of large proportions requiring considerable investment.

Therefore, in absence of expert advice, or preliminary to seeking council, an understanding of the general engineering requirements of the wire belt conveyor will save time and minimize redesigning.

Know Facts Then Choose

In order to select the proper belt, it is necessary to know type and size of product, thickness of layer on belt, and weight of product per linear foot. In addition, consideration must be given to the processing steps involved, whether hot, cold, wet, or dry.

When these facts are known, proper gage and alloy of wire can be determined. Calculated from the data are suitable length, width, and weave of belt and auxiliary conveyor equipment necessary to assure dependable operation of the assembly.

Correct Drive Vital

Sturdy though a wire belt may be, strains causing stretching, distortion, and ultimate failure can be the result of faulty selection or installation of conveyor accessories. Choice of drive mechanism is most critical. Failure-producing strain at the drive is due to too little contact between pulley and belt, or inadequate traction.

Though increasing the gripping efficiency of drive-pulley surface reduces belt strain, extent of this type improvement is limited. Most efficient method is to increase contact surface between belt and pulley.

Two procedures extend area of contact. While an increase in pulley diameter will enlarge pulley face, and thus traction area, operating conditions limit gains by pulley enlargement. Most satisfactory way to expand traction surface is to increase the arc of contact.

We will describe several drive arrangements and practical ways to increase the arc to as much as 450 deg.

Plain Pulley Drive—This is the simplest arrangement—one that allows a contact arc of between 135 and 180 deg. and is suitable for lightly loaded short conveyors. Factor determining belt length and load is the limit fixed by pulley diameter.

Snubbed Pulley Drive—With this one, arc can be increased to between 180 and 245 deg. It's done by modifying a plain drive with the addition of a snubber. Latter serves to wrap belt around pulley, thus to deliver as much as 15 percent more power.

Double Snubbed Drive—When single snubbing fails to attain desired traction, double snubbing can be employed to increase the arc up to 270 deg. Using snubbers as "pinch" rollers increases belt wrap still more—to 300 deg.

Tandem Drive—As much as 450 deg. of arc can be utilized as active drive surface by gearing together two drive pulleys in such manner that the belt engages both of them to form an S, the slack following the first being taken up by the second to impart additional wrap and traction.

Just as the first-mentioned simple pulley is suitable for light-loaded short conveyors, so each in the order described is required as belt length and load are increased. All pulleys are flat, since troughing distorts belt, causes failure. Additional traction gain by lagging the drive with rubber is approximately 10 percent.

Belt Take-Ups

Since wire belt conveyors, employing the drive arrangements described, pull the carrying surface, a slack return is recommended. If the under side is too taut, guides are ineffective and belt travel difficult to control. So it is necessary to provide slack side-tension where the belt leaves the drive pulley, and as near to the latter as possible, since the closer, the less the take-up tension required.

Take-up mechanisms are of two general types. The screw type is operated manually, while counterbalance, spring, and air cylinder-operated types perform automatically. Since counterweighted take-ups can be adjusted to maintain minimum required tension at which belt can be driven—regardless of starts under load, temperature changes, or stretch in belt—this type is preferred.

Belt Supports

Stationary supporting surfaces—angle-iron on sides and T's underneath—are adequate for belts of short length carrying light loads. Also a complete table-like undersupport is practical when conditions justify. Whatever the type of stationary support employed, belt wear and deterioration is reduced if contact surfaces are faced with soft metal, wood, or plastic.

Since idler rollers reduce friction as well as extend belt life, they are the first choice as supporting units. They should be longer than belt width to insure complete undersupport even when, due to temporary misalignment of conveyor, belt tends to creep sidewise.

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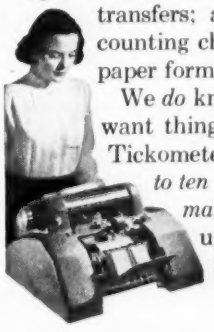

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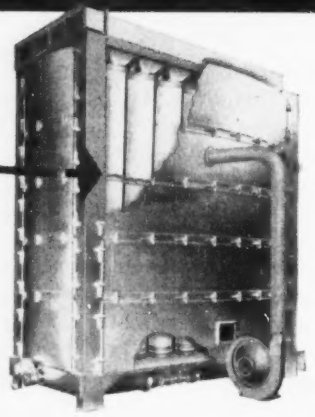

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A roller that fails to rotate with forward movement of the belt defeats its purpose. Therefore, frictionless type bearings should be selected. Also, since misalignment of a roller will cause side creep, supports should be adjustable horizontally.

Space allowed between rollers will depend on the length of the belt and the load. A 4 ft-wide, 150-ft.-long spray or fog cooling belt, with a load of 10-20 lb. per sq. ft., might require rollers under the carrying surface spaced 6 to 12 in. apart, and 4 ft. apart on the return.

On the other hand, support-rollers under a lightly loaded carrying surface of a short belt may be spaced at 4-6 ft., with rollers under the return at 12 ft. intervals.

However, to the extent that it is necessary to maintain a smooth carrying surface on any conveyor, space between rollers is reduced.

Guide Mechanisms

Angle-iron type wire belt guides should be considered only as expedients—merely as a means of temporary control of a belt out of alignment. When so employed, adjustments should be made immediately to correct travel when the belt slips out of alignment. Otherwise, angle iron guides will damage selvage and invite permanent belt failure. Lining angles with close-grain wood or plastic, or installing spring clips, will reduce damage to selvage.

Usually sufficient are guides on the slack return. But in some conveying conditions, additional carrying-surface guides are necessary.

When mounted directly on conveyor frame, a pair of vertical rollers provides a practical means of guiding a mesh belt. Best location is along the return, at a distance from the idler shaft equal to the width of the belt.

Additional slack return guides are needed on long conveyors. When it is advisable to install guide-rollers along carrying surface, one pair should be located immediately above the slack-return set nearest idler pulley.

Training a belt with least damage to selvage is assured by self-aligning guide rollers. A pair is mounted on either side of a pivoted base holding a support roller. Pressure against a guide swings the roller, thus correcting alignment. Expense of guides of this type is low-cost insurance on investment in a belt.

Concluding Part II, to appear in the next issue of FE, will consider special wire belt weaves, attachments, and applications.

End *(Resume reading on page 93)*

Questions & Answers

THIS MONTH'S PROBLEM

Question—We are considering manufacturing starch-type puddings—vanilla, butterscotch, and chocolate. Can you tell us how to make them?

Answer to May Problem

The Question Was—We wish to bleach and clean the outer shell of raw peanuts prior to roasting. Can you suggest what bleaching agent is suitable for this purpose, keeping in mind that the roasted peanuts are edible?

Answer—We suggest you look into the possibility of bleaching shells of raw peanuts with sulphur dioxide. This agent is currently being employed as a bleach and preservative for certain fruits and vegetables and is, therefore, satisfactory for a food product such as unshelled peanuts.

Try preparing a solution of sodium bisulfite or sodium metabisulfite containing 500 to 2,000 ppm. of sulphur dioxide. Then immerse the peanuts in sulfite solution for varying lengths of time. If you find shells are overbleached, then add water to reduce sulfite content of bleaching solution. By doing this, you will arrive at the proper amount of sulfite to use for the most economical results.

The sulphur dioxide should be dissipated during roasting.

Controlling Chocolate Temper

Question—*How can I assure proper temper of my chocolate through automatic control? I employ several 250-lb. stainless steel, jacketed tempering kettles, and move the chocolate to coating machines by thermostatically heated pipes.*

Answer—Several larger confectioners have solved this temper-control problem by going to a temperature-measurement system. Temper of chocolate can be correlated to a definite time-temperature curve in cooling of melted product. And, by controlling in accordance with that curve, it is possible to establish an exact tempering-kettle system that will deliver the chocolate to the enrober in the desired condition.

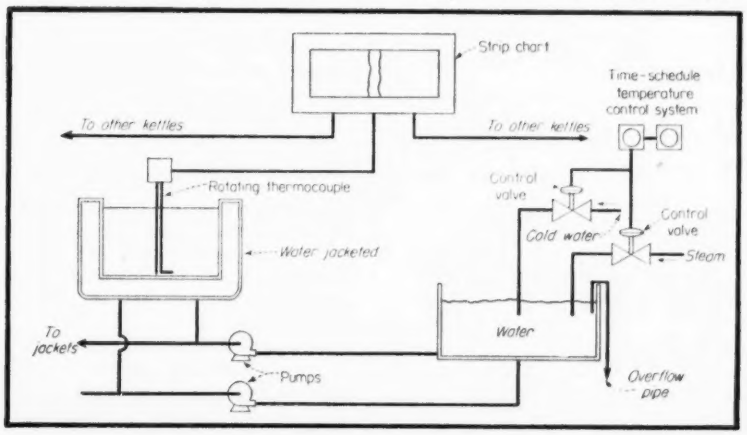
Naturally, make-up of the chocolate—type and quantity of fats it contains—has a great influence on the tempering cycle. Therefore, "jiffy" tests should be carried out whenever a new or questionable lot of chocolate is being run.

One large confectioner has a top-notch automatic tempering system. This firm has installed all tempering kettles in a 90-deg. F. room. Jacket water from each kettle is automatically controlled according to a pre-determined time-temperature curve, which is set up for the chocolate being handled. Each kettle is also equipped with a rotating thermocouple—set up on the agitator with a commutator—which provides a curve of the product temperature on a multi-point strip chart.

Another confectioner compares the strip-chart record of chocolate temperature with the water-temperature record of each kettle (see diagram). If the temperature varies appreciably, then the water jacket is cleaned to improve its heat-transfer efficiency.

Key to an automatic temperature-control system is through sensitive, extremely accurate temperature measurement of chocolate while in process. This approach permits an exact correlation of chocolate temperature with desired temper as well as a gradual jacket-water cooling—so essential to good tempering.

Now, with this correlation estab-



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lished, a metal cam must be cut out to simulate the perfect tempering cycle. Instruments will then control the heat-transfer schedule of the kettle in the desired manner. This is true, provided that the same chocolate is being handled. If new type of chocolate is to be used, then a new cam must be cut to assure automatic tempering.

Continuous tempering units—vertical or horizontal jacketed tubes equipped with an agitator—should provide a better opportunity of automatically controlling temper of chocolate. Composition of chocolate in this case must remain constant.

By installing high-speed resistance bulbs at various stages of the cooling cycle, a heat-balance curve can be obtained. Curve could then be correlated with the condition of the chocolate. Automatic control through valves on the coolant or through through-put volume could be easily arranged.

The use of ultrasonics may be another method for automatically tempering the chocolate. Ultrasonic vibrations will vary according to the viscosity of the chocolate. These vibrations may also indicate the fractional melting points of the chocolate fats and indirectly lead to an estimation of the nature of cocoa-butter crystals. Hence, it would be possible to set up a continuous ultrasonic-sampling system for determining the desired quality of the chocolate. Corrective measures could then be taken by varying amount of heat or agitation.

Chili-Hot Bean Formula

Question—I am interested in packing chili-hot beans, without meat. Many of the products of this type on the market are hot, but they do not

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have a sharp or tangy taste. Would you kindly furnish a formula for the sauce, and give the soaked bean-sauce ratio per can?

Answer—As all formulas for chili con carne include meat, we assume that you intend to market a beans-and-sauce product, to which the consumer will add meat.

The following formula represents a modification of a meat-containing product for commercial canning: Tomatoes, 10 gal.; ground chili pepper, 6 lb.; onions, 1 lb.; salt, 10 oz.; garlic, 2 oz.; wheat flour, 3 lb.; and water, 6 gal.

The bean-sauce ratio is, of course, largely a matter of preference as to whether the product desired is to be thick or thin. You can obtain an idea of the desirable proportions by experimentation. In general, for beans of the kidney type, a ratio of about 0.90 for sauce to soaked beans is reasonable.

Correction of the flat taste you mentioned may lie in increasing the tomato components, which, of course, carries a natural acid of its own. You might even experiment with a little additional vinegar, although it is not a usual ingredient. You might even try adding a little more salt. And do not overlook the possibility of using a little more onion or garlic, since they may not at all be objectionable to consumers who prefer a hot product.

Don't be afraid to cook up a few batches of chili con carne in your own kitchen, using different formulas. After all, your product will be judged by the excellence of the finished item prepared by the consumer and not as a product complete in itself.

Wash-Water Sterilizer

Question—Can you suggest the use of a suitable chemical sterilizing agent to be added to water for washing fresh fruits and vegetables during their preparation for marketing? How much should be used?

Answer—Of various chemical sterilizing agents tried, those generally used are chlorine compounds or free chlorine. Most commonly used commercially are sodium or calcium hypochlorites in concentrations ranging from 50 to about 2,000 ppm. Higher concentrations have been known to taint the produce.

Users of these sterilizing agents report that they prevent fungal and bacterial build-up in the wash water. As a result, cross-contamination and possible deterioration of prepackaged produce is minimized.

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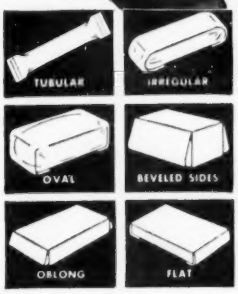

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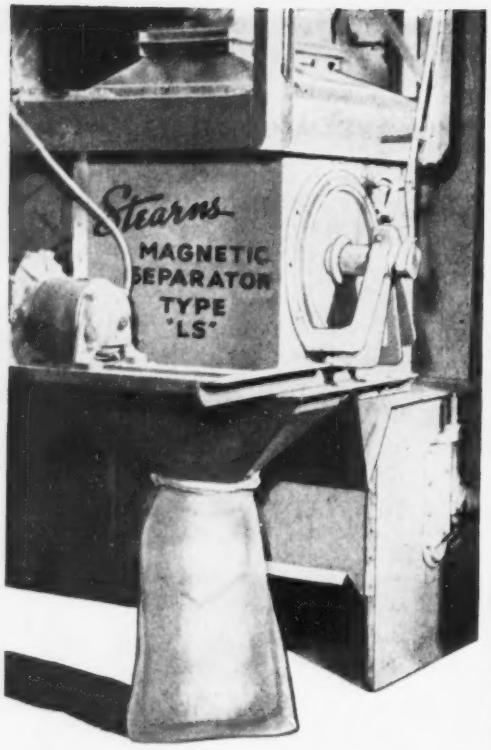

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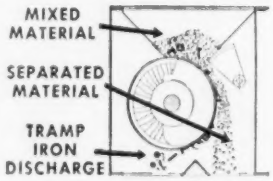

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Type "LS" (left) and Type "LP" (right) are particularly designed for dust-tight applications and are built as a complete unit for direct attachment to spouts and chutes. Electro and permanent magnetic models available in all sizes. Write for descriptive literature.

1022

MAGNETIC EQUIPMENT FOR ALL INDUSTRY

STEARNS MAGNETS

STEARNS MAGNETIC, INC.
Address: 667 South 28th Street, Milwaukee 46, Wis.

One packer is using sodium bisulfite in wash waters for mixed salads. However, this chemical will bleach butts of celery and lettuce, and is likely to damage green parts of vegetables.

To control gray and blue molds on apples and pears, sodium chlorortho-phenyl phenol has proved successful. It does not control brown rot, however. A 0.6-percent concentration is used in wash water, provided fruit is then rinsed with clean water. If fruit is not rinsed, then a 0.4-percent concentration of this agent is employed. We should point out that this chemical causes dermatitis, when improperly handled by an attendant.

Borax, in warm solution, has been used for washing citrus fruits, and a 3-percent solution of borax (at 110 deg. F.) has been used for green tomatoes.

If there is a continuous supply of fresh water available, then there appears to be no need of introducing a chemical sterilizing agent to wash water.

Re Quick-Cured Bacon

Question—Do you know if there are differences in quality and shelf-life of regular-cured and thermo-cured bacon?

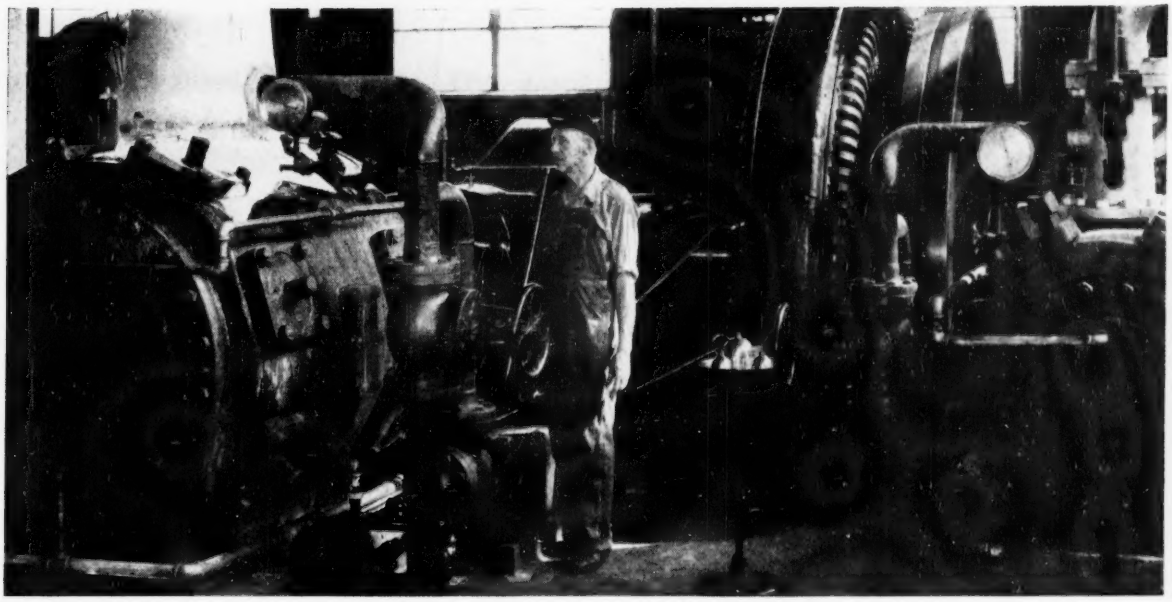
Answer—According to tests carried out by researchers at American Meat Institute and a meat packer, flavor apparently is affected by high temperature cure. The flavor appears bland. And, on occasions, certain flavors were detected that were not normally associated with bacon. Apparently, more research must be undertaken on this accelerated method of curing bacon.

However, other results have shown that thermo-cured bacon had a longer shelf-life. Thermo-cured bacon became stale after 8 wk. at 35 deg. F., while the regular-cured bacon took 2 wk.

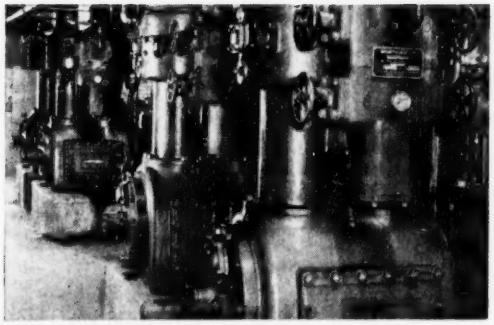
Bread Staling Problem

Question—We are having considerable difficulty keeping our Vienna bread soft for any length of time. Retail-store operators complain that bread does not soften up, even when held on display shelves for a short length of time. Also, customers find that bread becomes dry and hard within an hour after slicing it. As a result, sales have dropped about 10 percent. Do you have any suggestions on what causes these adverse changes in our bread and how they can be prevented?

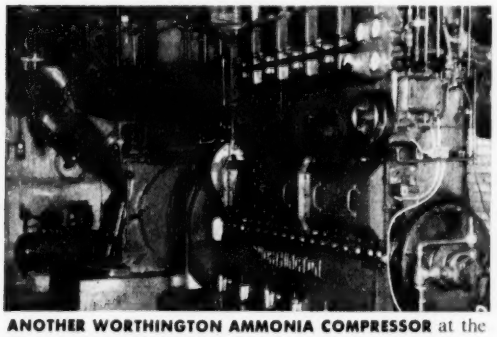
Answer—Vienna or Italian type



THE FIRST WORTHINGTON AMMONIA COMPRESSOR EVER BUILT, installed at Quincy Market 35 years ago.



DEPENDABLE REFRIGERATION is supplied by these four modern Worthington vertical ammonia compressors at Quincy Market's Watertown, Mass., plant.



ANOTHER WORTHINGTON AMMONIA COMPRESSOR at the Watertown plant. This one is a two-stage, "Y" type, driven by a Worthington Diesel.

Worthington ammonia compressor still in daily use after 35 years

Back in 1918, the Quincy Market Cold Storage & Warehouse Company in Boston bought its first Worthington ammonia refrigeration compressor.

This machine, a horizontal two-stage unit running at 164 rpm, and having a capacity of about 400 tons of sub-zero refrigeration, was the starting point for drastic changes in the engineering of ammonia compressors. Eventually, the principles of design established in this initial unit were adopted by all refrigeration manufacturers.

The compressor Worthington built for Quincy Market in 1918 is still in service—after 35 years of heavy-duty operation. And today, in Quincy Market's T Wharf and Sargents Wharf power plants in Boston, their new frozen food warehouses in Watertown, Mass., Portland, Maine, and their warehouse in Troy, N. Y., many other installations of Worthington equipment are supplying dependable, efficient refrigeration. The Quincy Market has been famous for over 60 years for the quality storage of millions of pounds of frozen foods.

For over half a century, Worthington refrigeration equipment has been serving the "first names" in the food industry. So when you think of refrigeration—think of Worthington. Get in touch with your nearest Worthington district office, or write Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.3.5, Harrison, N. J.

WORTHINGTON

CLIMATE ENGINEERS TO INDUSTRY, BUSINESS AND THE HOME A.3.5

For more information, use coupon on page 159.

HOW TO CONTROL PRODUCTION COSTS

Just Published!

Brings a thoroughly unique approach to the problem of cost, pricing, and profit in manufacturing, showing how to reckon costs by the total conversion cost method. Fully explains the approach and describes the methods to plug cost leaks . . . know how to price each line . . . and develop effective methods of cutting costs and increasing production. Gives every tool for putting the method to work, telling how to set up a realistic overhead . . . find standard material costs . . . pilot expenses . . . find variances. **By Phil Carroll. 264 pp., 76 illus., $5.00**

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This practical book helps you set up and maintain safe sanitation practices throughout your plant; gives tested methods to get best results in food processing; protects you from legal liabilities. Covers practices that meet Federal Food, Drug and Cosmetic Act; plant layout and design; selection of packaging materials. Shows how to control pest contamination; maintain employee interest; cut down spoilage. **By Milton E. Parker, Counselor in Food Production Development. 434 pp., 129 illus., $6.50**

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A practical guide for plant owners, managers, and engineers concerned with the problem of dealing with industrial wastes. Covers the important legal aspects of stream pollution, tells how to secure samples and data, and how to develop and test a method of treatment. Discusses factors of plant design and construction to minimize pollution, and the techniques of reclaiming by-products from industrial wastes. **By E. B. Besselievre. Chief Sanitary Engineer, Foreign Div., The Dorr Co., Engineers. 365 pp., 100 illus., $7.50**

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(Print)
Name .....
Address .....
City ..... Zone..... State.....
Company .....
Position FOOD-7

This offer applies to U. S. only.

breads usually do not contain milk or shortening, but are prepared with a high gluten flour. Hence, moisture is transferred from starch to protein molecules to cause staling.

Fats and milk solids used in preparation of regular types of breads, together with immediate wrapping in wax paper or other films, minimize staling.

Recently, monoglycerides and polyoxyethylene stearates have been extensively employed as bread softeners, and have postponed staling for some time. Use of polyoxyethylene stearates, however, has recently been banned by federal authorities.

Here's what you can do in an attempt to minimize staling:

First, try raising temperature of oven slightly so that more moisture can be retained in baked loaf. In raising temperature, it will be necessary to correspondingly shorten baking time.

Second, keep baked loaves of bread in a moderately warm, rather than cold room.

Third, get the bread to stores as fast as possible, rather than cart it around in delivery trucks for any length of time.

On Canning Beverages

Question—We've learned that a new line of canned soft drinks have recently hit the New York market. They are appearing in non-returnable, no-deposit, cone-shaped cans in 6- and 12-oz. sizes. Several years ago, Pepsi-Cola was introduced in cans in several cities, and we believe others have tried it. We wonder why these last ventures proved unsuccessful.

Answer—Pilot-plant tests on canning Pepsi-Cola in four plants about three years ago were considered unsuccessful by that bottler. Reasons were that cost of cans was excessive (they ran between 3½-5¢ each), and at that time tin was scarce. Too, market tests revealed that the price—three 12-oz. cans at 25¢—proved unpopular, particularly since six bottles were being retailed for 37-39¢.

As a matter of fact, the U. S. Navy was interested in purchasing canned Pepsi at that time. However, no order was placed because of high cost.

There is certainly an appreciable differential between the cost of one-trip cans and bottles. While the latter cost about 5½¢ each, they are used about 15 times.

Actually, high-speed bottling and canning lines are similar. Only equipment not required on a canning line

(Turn to page 180)

How to keep informed on the "with what" part of your business

AT YOUR FINGER TIPS, issue after issue, is one of your richest veins of job information—advertising. You might call it the "with what" type—which dovetails the "how" of the editorial pages. Easy to read, talking your language, geared specifically to the betterment of your business, this is the kind of practical data which may well help you do a job quicker, better—save your company money.

Each advertiser is obviously doing his level best to give you helpful information. By showing, through the advertising pages, how his product or service can benefit *you* and *your* company, he is taking *his* most efficient way toward a sale.

Add up all the advertisers and you've got a gold mine of current, on-the-job information. Yours for the reading are a wealth of data and facts on the very latest in products, services, tools . . . product developments, materials, processes, methods.

You, too, have a big stake in the advertising pages. Read them regularly, carefully to keep job-informed on the "with what" part of your business.

McGRAW-HILL PUBLICATIONS

Kelite found the key to better packaging with

RHEEMCOTE POSTER DRUMS

It's no secret when Kelite Products, Inc., ship their cleaning compounds to their growing list of customers... because these chemical compounds are shipped in colorful, Rheemcote lithographed Poster Drums. These drums provide both a safe, sturdy container and brand and trade-mark identification.

Rheemcote containers can be lithographed in any number of colors, any design, including halftones. The high-gloss finish is tough, long-lasting. When necessary, interiors can be roller-coated with special protective lacquers.

If your product is shipped in steel containers, let Rheem show you the way to added prestige and profit... with Rheemcote Poster Drums.

Write for free colorful booklet on this powerful new advertising medium. Rheem Manufacturing Company, 4361 Firestone Boulevard, South Gate, California.

Sell as you Ship with **Rheemcote drums**

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For your next plant managers conference!

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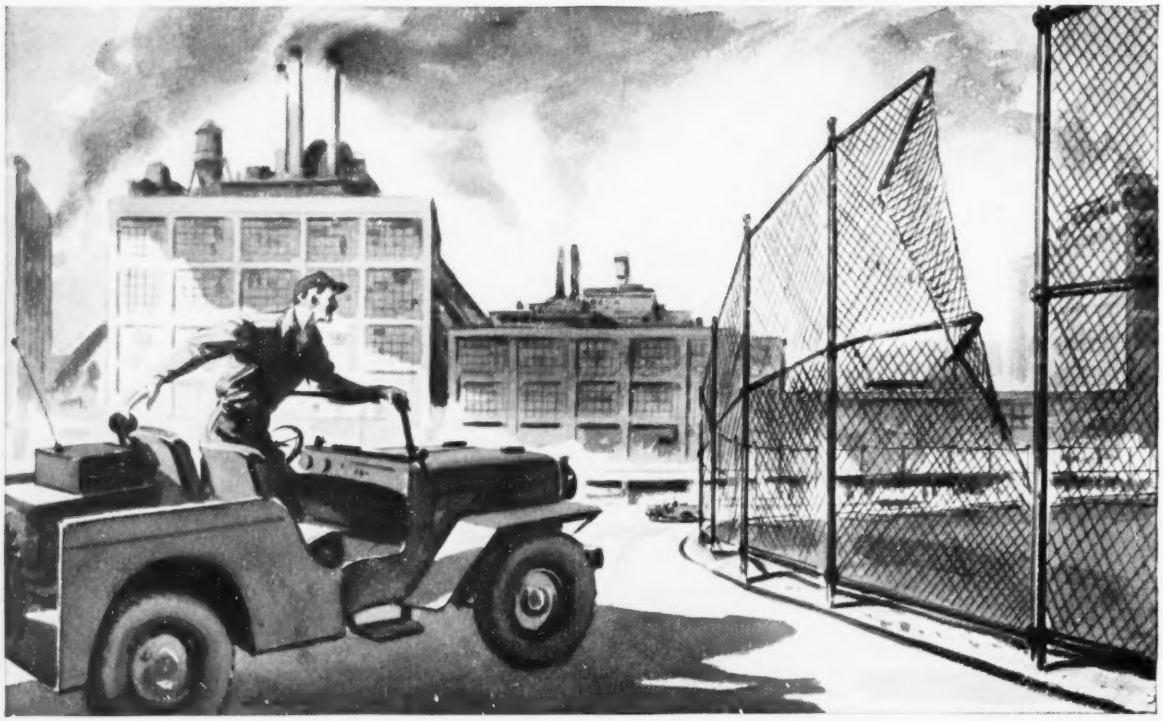

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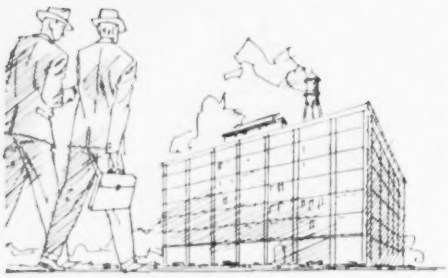
YEARS OF ELECTRICAL PROGRESS



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THE protection of your interests is the sole reason for a plant patrol system—be it a walking guard or vehicle spot check. Realizing its importance you must appreciate the radically new effectiveness . . . the huge saving in time and expense with G-E radio to co-ordinate patrol reports. Add this "extra" value to plant radio performance as a fire fighting system . . . a faster service facility . . . and the best way to increase production rates. Each of these reasons warrants a budget allocation for radio . . . collectively they demand it!

Take a tip from the many companies that have benefited from *G-E's industrial communications experience.* You'll discover G-E equipment offers not only reliable performance but built-in quality of construction to assure minimum maintenance . . . your complete satisfaction!

GENERAL ELECTRIC

Add Nutrition-Appeal to Your Vegetable Fat Frozen Dessert

with Pfizer **Vitamin A**

• Give the vitamin-conscious housewife full nutrition value in your vegetable fat frozen desserts...then watch sales rise!

By making your product stand up favorably nutritionwise against more expensive desserts, Vitamin A can be an effective sales maker. And Vitamin A fortification costs so little...as little as *a quarter cent* per gallon of dessert produced!

Pfizer Vitamin A Acetate in vegetable oil is ideal for incorporation in vegetable fat frozen desserts. It shows no significant loss of stability during dessert processing or storage and imparts no off-flavors or aromas. You can buy Vitamin A Acetate in batch-size cans to fit your particular requirement.

Write to Pfizer, one of America's *basic* Vitamin A producers, for authoritative information. Ask for technical data sheets on Vitamin A for frozen desserts.

CHAS. PFIZER & CO., INC.
630 Flushing Ave., Brooklyn 6, N. Y.
Branch Offices: Chicago, Ill.; San Francisco, Calif.; Vernon, Calif.; Atlanta, Ga.

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FLEXIBLE STEEL
CONVEYOR BELTING
...faster, better
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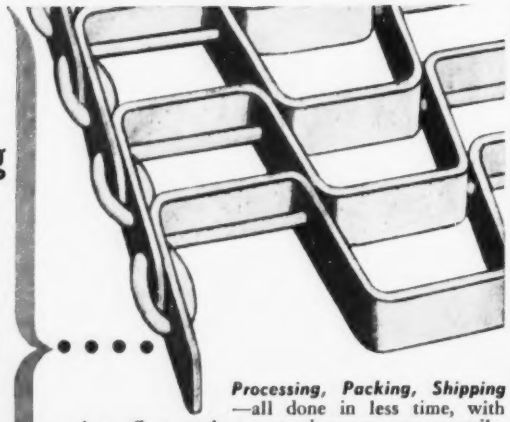
less maintenance



Processing, Packing, Shipping —all done in less time, with less effort, at less cost when you use versatile, long-wearing LaPorte FLEXIBLE Steel Conveyor Belting.

LaPorte's Flexible Steel construction prevents *creeping, weaving* or *jumping,* by providing a tighter grip on the friction drum. This also assures a perfectly flat surface for containers, empty or filled . . . results in a smooth, steady flow of products through every process from loading bin to shipper. Open mesh feature also permits circulation of air and liquids around products in process — simplifies cleaning and sterilization. Highly resistant to heat and cold. Available in any length, practically any width.

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LA PORTE MAT & MFG. CO.
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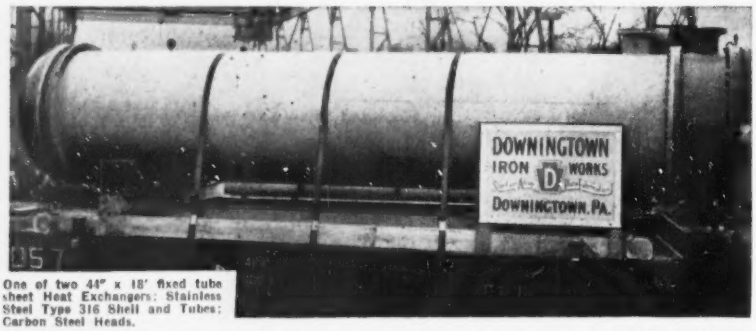
and ANOTHER FINE HEAT EXCHANGER



One of two 44" x 18' fixed tube sheet Heat Exchangers: Stainless Steel Type 316 Shell and Tubes: Carbon Steel Heads.

ON ITS WAY TOWARD CUSTOMER SATISFACTION

. . . Yes, DOWNINGTOWN solicits your inquiry for Heat Transfer Equipment fabricated of Aluminum, Inconel, Nickel, Phosphor and Aluminum Bronze, Copper, Stainless, Monel, Silicon Bronze and various grades of Carbon Steel.

Design and construction will meet requirements of A.S.M.E. Code or other agency specified by customer. Equipment of our design is sold on a guaranteed performance basis or we will fabricate to customer's drawings. Modern facilities available for radiographing, stress relieving and heat treating, where required. Remember: "Your Needs are Our Specialty!"

DOWNINGTOWN is experienced in building equipment with Bi-metallic, Finned Tube and Karbate Graphite.

Write on your letterhead for DOWNINGTOWN literature on shell and tube heat exchangers.

DOWNINGTOWN IRON WORKS, INC.
DOWNINGTOWN-PENNA.
DIVISION OF PRESSED STEEL TANK COMPANY
Hackney
STEEL AND ALLOY PLATE FABRICATION AND HEAT EXCHANGERS

is a bottle soaker, but an automatic can-level checker is needed. Both lines employ a combination 60-valve rotary filler and 10-head crowner as well as an automatic case packer.

True, canned beer made serious inroads on the bottled product, but beer is in a higher price range than soft drinks. If soft drinks get up to the 10¢ price range, then it is possible that more bottlers will be interested in canning soft drinks.

Inside of Cans Blacken

Question—We have been playing around in the laboratory with the idea of packing lobster meat. After holding them for about 5 months, we opened the cans and found that the meat and the inside of the cans had darkened. Is there any method of overcoming this objectionable condition?

Answer—First of all, we suggest that you contact one of the can companies for they will quickly put an end to your difficulty.

However, we can tell you what has happened. Sulphur compounds in the lobster meat break down during heat processing and react with the iron base of the tinplate to form iron sulphide—a black compound that discolores the meat and cans.

Many years ago, the Research Laboratory of National Canners Assn. found that harmless zinc salts curbed this discoloration by combining with the sulphides to form zinc sulphide—a white compound. As a result, this laboratory developed a lacquer with small amounts of zinc as an inside lining for the cans.

Wants to Make Pea Soup

Question—Can you furnish me with a formula and details covering manufacture of canned split pea soup?

Answer—You can start with this formula, modifying it to suit your taste: Green split peas, 35 lb.; water, 12 gal.; salt, 1 lb. 11 oz.; onion powder, 9½ oz.; sugar, 9½ oz.; pepper (white), ¼ oz.; bacon, 15 oz.; sweetened condensed milk, 3 lb.; and monosodium glutamate, 1½ oz.

In preparing soup, first convey dry peas along an inspection table, and remove any foreign matter. A permanent magnet can be installed over the line to pick up any pieces of metal.

Next soak the peas at least 12 hr. in cold water. Drain peas and add to a steam jacketed kettle along with the water. The kettle should be equipped with a mechanical agitator. While bringing the batch to a boil, introduce finely chopped bacon. Then add salt,

"We're adding 22 new Dodge trucks to our fleet!"

. . . says **R. H. PRICE,** *Treasurer, Certified Grocers of California, Ltd., Los Angeles, California*

"We're making our fleet 100% Dodge, because our frozen-food trucks must be completely dependable! Our present Dodge trucks make as high as forty-five starts and stops per day—constantly fighting heavy traffic—which is the hardest kind of strain. Yet, our Dodges stick to it, day in and day out—with less repairs, less gas, oil, tires and depreciation than any other trucks we've used!

"And with the larger new Dodge engines and greater carrying capacities, we're certain our new Dodge trucks will make our operation even more economical and dependable than before!"

Why new DODGE *"Job-Rated"* TRUCKS are more economical than ever!

"Job-Rated" POWER SAVES YOU MONEY!

Only Dodge offers seven engines . . . 3 brand-new . . . from 100 to 171 h.p. Thus you get the *right* engine for the job; an engine that delivers maximum performance and long-range dependability with *minimum upkeep!* Dodge engines have hosts of features that assure longer life at far less cost: floating oil intakes, full-pressure lubrication systems, exhaust valve seat inserts, two fuel filters and chrome-plated top rings. In addition, 4-ring aluminum-alloy pistons and higher compression ratios help bring oil and gas expense right down to earth!

BIGGER PAYLOADS FOR GREATER INCOME!

Dodge trucks now haul bigger payloads than ever, with some Gross Combination Weights increased by as much as 5,000 pounds! And Dodge is still the most maneuverable truck you can buy. Wide front treads and shorter wheelbases cut "Jockeying" time and speed deliveries. For extra safety, new Dodge dual-primary rear brakes give smoother, sure stops with less pedal pressure. So talk it over with your friendly Dodge dealer. He's making real money-saving deals these days!

DODGE

"Job-Rated" TRUCKS

For more information, use coupon on page 159.

heart of the strainer

A high-grade, woven Monel wire screen is the heart of the Yarway Strainer—one reason why hundreds of thousands of these strainers are policing pipe lines in nearly every industry.

OTHER REASONS—

- cadmium plated bodies and screen caps
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- ten sizes from ¼" to 3"

Sold by 216 industrial distributors. Write for Bulletin S-203.

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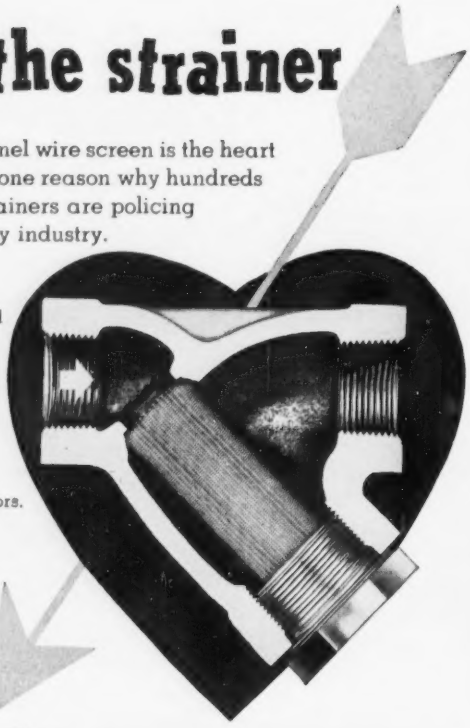
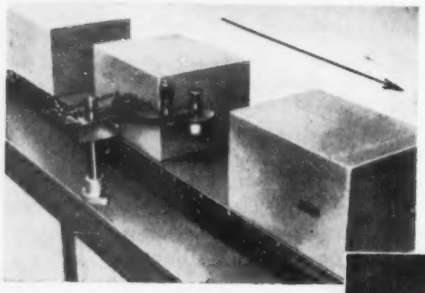


YARWAY **STRAINERS**

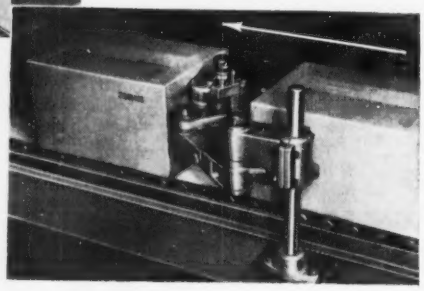
For quicker warehouse stacking, quicker identification...

MARK ALL 4 SIDES OF CASES AUTOMATICALLY...*in a single pass*



New ROLACODER units attach to conveyor or sealer . . . imprint code-dates, lot numbers on all 4 panels of cases simultaneously . . . *without requiring cases to be turned.*

ROLACODER 500
imprints *front* and one *side* panel simultaneously



ROLACODER 200
imprints *rear* and other *side* panel simultaneously

Write for new descriptive sheet ROL-1

Gottscho

ADOLPH GOTTSCHO, INC.
Machines to Mark Whatever You Make
Hillside 5, N. J.

50TH YEAR

sugar, pepper, and monosodium glutamate.

Toward the end of the cook (about 1 hr.), pour in condensed milk, and finish the cook. Run soup through finisher with 0.023-in. screen, fill into enameled cans, seal cans, and process in retorts at 225 deg. F. for 45 min.

Feeding Continuous Process

Question—I am considering the installation of continuous cocoa bean roasters. I should like to know if there is any way of feeding these roasters at a closely controlled and uniform rate so that every bean will receive the same heat exposure.

Answer—There are various ways of feeding loose, dry, materials continuously and at a controlled rate, to a process such as roasting.

One way is to use either volumetric or gravimetric continuous feeders (sometimes called proportioners). Flour, prepared mix, and feed mills use equipment of this type to feed various ingredients, like vitamins, into mix on a continuous, precise basis.

For highly accurate work, gravimetric feeder usually is employed, but volumetric type is quite suitable for applications which do not require extreme accuracy. Therefore, a volumetric feeder, such as the rotating-pocket type, should serve your purpose nicely.

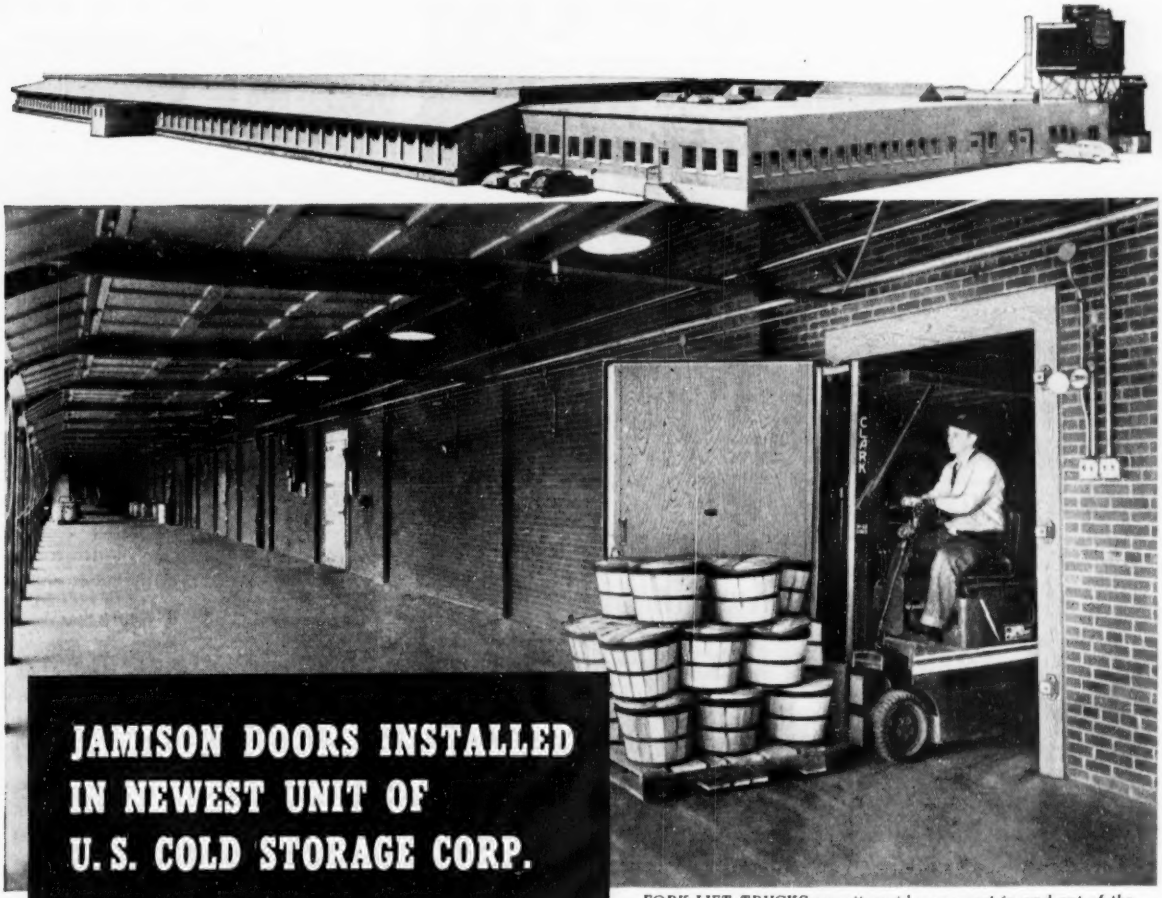
Another way of continuously feeding your roasters is to employ vibrating-type conveyors. These are used for feeding dry, free-flowing materials into weigh hoppers of package filling machines. Vibrating feeders are available in a range of types which will handle small to high rates of feed, and are built with variable control for fast and slow feeding.

Perhaps the simplest device for your purpose, however, would be a closed screw conveyor—equipped with a variable-speed drive. The conveyor would be fed from a free-flowing hopper equipped with an electromagnetic vibrator to assure constant flow to the conveyor. Being a positive-displacement mechanism, screw conveyor would deliver flow of material at a constant rate, and variable-speed drive would permit adjustment of the rate.

Wants To Make Liver Paste

Question—Could you furnish me with a formula and complete details on manufacture of liver paste or spread to be put up in 3-oz. cans?

Answer—Here's a formula containing 57 percent by weight of fresh pork livers in an approximate 445-lb. batch: Pork livers, 262 lb.; pork trimmings,



JAMISON DOORS INSTALLED IN NEWEST UNIT OF U. S. COLD STORAGE CORP.

FORK-LIFT TRUCKS permit rapid movement in and out of the cold storage rooms along this loading dock.

The U. S. Cold Storage Corp. has equipped its splendid new Omaha plant entirely with Jamison modern Series "50" Cooler and Freezer Doors. This new warehouse combines the latest in design, methods and equipment. It has 2,000,000 cubic feet of refrigerated space and a storage capacity of 25,000,000 pounds.

Jamison's exclusive hardware and rigid box-girder construction stand up under the heaviest punishment of electric truck operation. At this installation, the Series "50" doors meet a wide range of storage requirements. The 5-by-8-foot opening permits faster and easier handling by lift trucks.

There are 26 Jamison doors in the warehouse. Twenty-two open onto the loading dock with eleven on the track dock and eleven on the truck dock. Request Catalog No. 3 for details and specifications. Jamison Cold Storage Door Co., Hagerstown, Md., U. S. A.

THESE UNUSUALLY WIDE doors permit rapid movement of heavy loads by means of hand trucks as well as electric trucks.

JAMISON

HAGERSTOWN, MARYLAND, U. S. A.

THE LEADER FOR OVER FIFTY YEARS

For more information, use coupon on page 159.

Cyclone Equalized Conveyor Belt
Speeds Up
Tomato Picking and Packing
• Now Cyclone Conveyor Belts go right into the field where the tomatoes are grown. A new Row Crop Harvester, equipped with a Cyclone Equalized Conveyor Belt, is tractor-pulled down the field. Workers place tomatoes on the moving belt, which elevates them to truck for sorting, packing and stacking. Result: A saving in both time and amount of actual field labor.
You may not need as new or revolutionary a change as this in your food processing operation. But if you have a plant bottleneck of any kind, the chances are a Cyclone Conveyor Belt could eliminate it. Ask our experienced engineers for advice, and write Dept. H-73 for a free Catalog No. 4.
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• IN FOOD PROCESSING
When You Use
Low Temperature
USE CORK

The time to make sure of your insulation protection is before you build or expand. Get the facts on Cork insulation when they can do the most good. Cork is so efficient in insulating properties that its performance has long been the accepted standard for low temperature requirements. Its wide usage in the refrigeration industry is due to its proved record for more than 40 years. Mundet refrigeration engineers are experienced in all details of temperature control. Write to us now for recommendations and estimates . . . let us help you secure the most profitable use of low temperature. Mundet Cork Corporation, Insulation Division, 7101 Tonnelle Ave., North Bergen, N. J.

MUNDET
CORK INSULATION

112 lb.; tripe, 37 lb.; processed flour, 22 lb.; salt, 9 lb.; ground pepper (white), 1½ lb.; ground mace, 9 oz.; ground marjoram, 4½ oz.; and ground cloves, 2 oz.

Preparation of liver paste calls for careful trimming of livers, especially in removal of any bile-contaminated portions. Pork trimmings are cut into approximately 1½-in. pieces in a chopper or rotary-disk cutter. And tripe is bleached overnight in about a 1-grain vinegar solution.

Fresh meats—livers, trimmings, and tripe—are now separately boiled about 30 min. Meats are loaded into wire crates and water-boiled.

Precooked, coarsely ground meats are next fed to a silent cutter, in which they are chopped about 8 min. to a smooth paste. During this period, ground spices are introduced together with dry, cold-water absorbing process flour. Addition of flour in dry form will enable you to easily judge consistency of meat paste and possible need for adding more water.

Now paste is introduced into a steam-jacketed kettle, heated, and then filled into 208x109-size cans. Finally, canned liver paste is heat-processed 60 min. at 240 deg. F.

Needs Meat Sauce Formula

Question—We would like to prepare a meat sauce. Do you have a formula for preparing this sauce, as well as instructions on how to manufacture it? Can the sauce be bottled, or must it be canned?

Answer—Here's an excellent formula for making an inexpensive meat sauce: Beef stock, 25 lb.; white flour, 2 lb.; shortening, 3 lb.; white onions, 15 oz.; garlic, 1 oz.; thyme, 1 oz.; white pepper, 2 oz.; whole cloves, 2 oz.; carrots, 15 oz.; bay leaves, 3 oz.

In preparing the sauce, melt the shortening with low heat. Meanwhile, run the onions and carrots through a grinder, add to the melted fat, and gently fry, with careful stirring, for about 10 min.

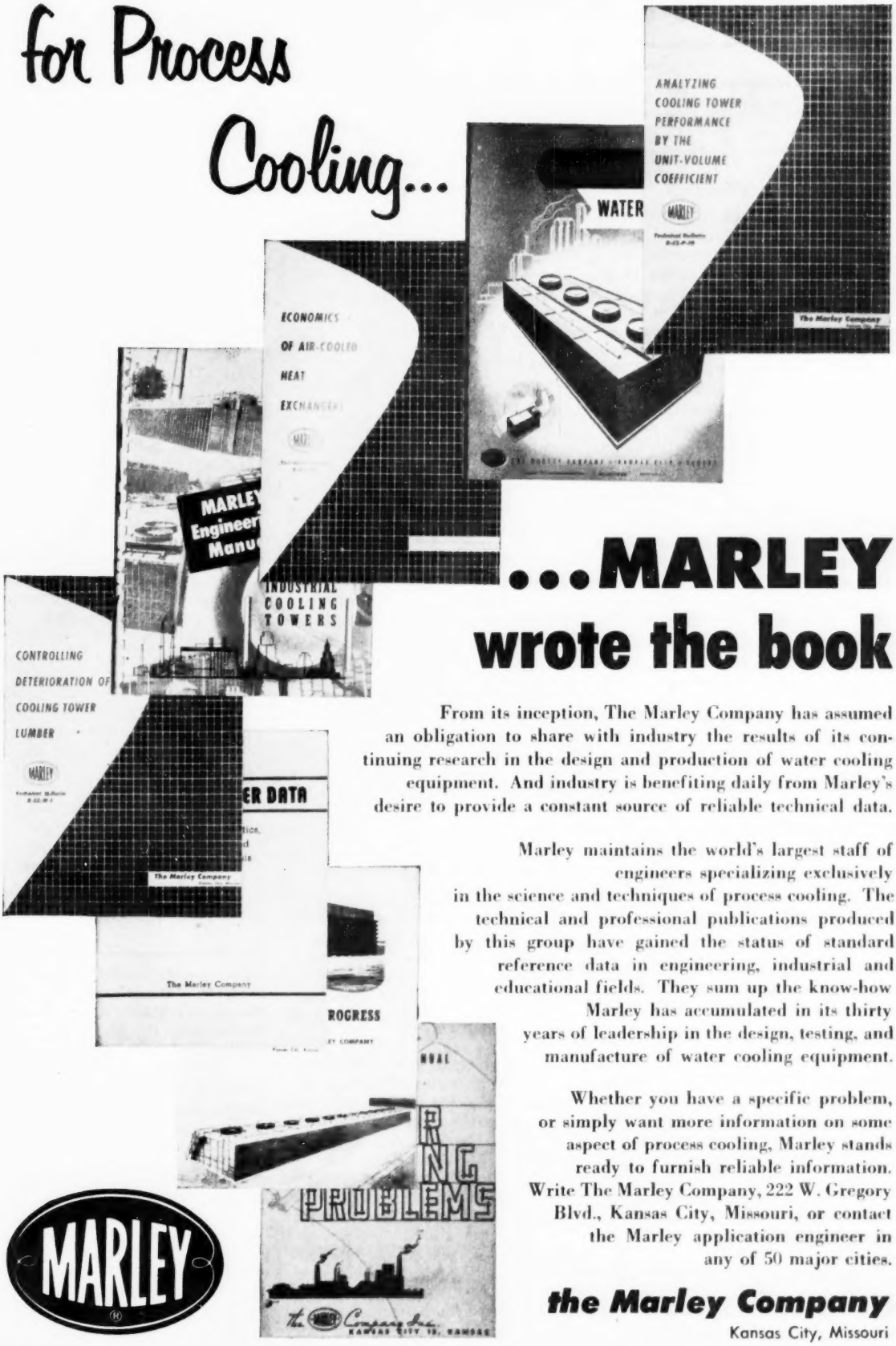
At this point, sift the flour and add it to the melted fat. Continue frying until the batch turns dark brown. Now add the spices and continue frying another 10 min. The sauce is quite thick at this stage.

Before proceeding, you might want to make adjustments in the amounts of seasonings already added—either to meet your taste or the consumer's.

Now cool the batch and strain through a fine-mesh screen. Then fill the sauce (which is heated to boiling) in 4- or 6-oz. bottles, and cap. Further processing is not required, nor is it necessary to can the sauce.

For more information, use coupon on page 159.

for Process Cooling...



...MARLEY wrote the book

From its inception, The Marley Company has assumed an obligation to share with industry the results of its continuing research in the design and production of water cooling equipment. And industry is benefiting daily from Marley's desire to provide a constant source of reliable technical data.

Marley maintains the world's largest staff of engineers specializing exclusively in the science and techniques of process cooling. The technical and professional publications produced by this group have gained the status of standard reference data in engineering, industrial and educational fields. They sum up the know-how Marley has accumulated in its thirty years of leadership in the design, testing, and manufacture of water cooling equipment.

Whether you have a specific problem, or simply want more information on some aspect of process cooling, Marley stands ready to furnish reliable information. Write The Marley Company, 222 W. Gregory Blvd., Kansas City, Missouri, or contact the Marley application engineer in any of 50 major cities.

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Kansas City, Missouri

For more information, use coupon on page 159.

Useful New Books & Government Publications

Air Purification

AIR CONSERVATION ENGINEERING. *By Henry Sleik and Amos Turk. Published by Connor Engineering Corp., Danbury, Conn. 1953. 76 pages; 8½x11 in., cloth. Price $5.*

Reissue of a 1944 book, this work is a factual appraisal of the value of purifying air. Though retaining basic principles of previous edition, book incorporates latest developments and progress made in purification of air.

One of the innovations discussed is use of purification in retarding metabolism of stored fruits and vegetables.

Also covered is inhibition of specific tissue diseases, protection of foods against organic decay, and preservation of natural flavors.

Catalytic combustion is also featured, with details on controlling odors in high concentration and at high temperatures by a process which converts odorants to moisture and carbon dioxide.

Illustrated and containing many charts and graphs, book was written by two officials of Connor Engineering Corp.

Sanitary Engineering

WATER SUPPLY AND SEWERAGE. *Third Edition. By Ernest W. Steel. Published by McGraw-Hill Book Co., 330 W. 42nd St., New York 36. 1953. 582 pages; 6x9¼ in., cloth. Price $8.*

Combining the principles and practices of two closely related fields, the author presents a concise and well-balanced text book for students and engineers.

Illustrated with sketches and diagrams, book brings up to date work of last edition with recent developments in both fields, including new material on unit hydrograph, equilibrium analysis of flow in wells, and fire-flow tests. Moreover, characteristics of pump combinations have been added. Matter considered obsolete has been deleted.

Chapters on water supply cover: Consumption of water; development of surface and groundwater supplies; materials used in pipes and conduits; pumps and pumping; design, construction, and maintenance of water distribution systems; and various methods of water treatment in general use.

Material on sewage includes: amount of sanitary and storm sewage to be expected; design, construction, and maintenance of sanitary, storm, and combined sewer systems; pumping of sewage; stream pollution and recovery; and treatment for preparing sewage for disposal.

Book includes an appendix on drinking water standards, and it is indexed.

Author is professor of sanitary engineering at University of Texas.

Cellulose Biography

CELLULOSE, THE CHEMICAL THAT GROWS. *By Williams Haynes. Published by Doubleday & Co., Inc., Garden City, N. Y. 1953. 386 pages; 5½x8¼ in., cloth. Price $4.*

The fascinating story of cellulose, from the days of Marco Polo to the present, is fully explored and presented in this easy-to-read volume. Complex, paradoxical qualities of "the versatile chemical that grows" are widely discussed.

Lively and interesting, the book follows the extraordinary path of cellulose, through its encounters with persevering scientists and students, to the important role it plays in industry today.

It is well illustrated with photos and diagrams. Informative glossary and appendices supplement chapters. Indexed.

Author is well known for his *American Chemical Industry: A History; Men, Money & Molecules;* and, *This Chemical Age.*

F&DA Records

FEDERAL FOOD, DRUG, AND COSMETIC ACT, JUDICIAL AND ADMINISTRATIVE RECORD, 1951-1952. *By Vincent A. Kleinfeld and Charles Wesley Dunn. Published by Commerce Clearing House, Inc., 214 N. Michigan Ave., Chicago 1. 1953. 588 pages; 6⅝x9⅞ in., cloth. Price $12.*

Fourth research book in the "Food Law Institute Series", this book is a compilation of the administrative and judicial record of the Federal Food, Drug, and Cosmetic Act, from January 1951 to January 1953.

Purpose of volume is to furnish a useful guide and source book, not only for the attorney specializing in this field, but also for business and administrative officials in the food, drug, cosmetic, and related industries.

Essentially, book is divided into four sections. First are the opinions rendered during 1951 and 1952 under the Act. Second portion contains "Statements of General Policy or Interpretation", issued by F&DA during 1951-52. Third section covers in full any new regulations promulgated by the Federal Security Administrator during 1951-52 dealing with definitions and standards for foods. Fourth part furnishes references to pertinent material for the 1951-52 period in connection with problems which may arise under any section of the Act.

Cumulative tables of cases and table of forms, covering authors' earlier volumes, as well as this book, are included. Comprehensively indexed for ready reference.

Government Publications

AGRICULTURAL STATISTICS, 1952 *USDA. 876 pages. $2.00. Latest in the annual series of data pertaining to agricultural commodities and operations.*

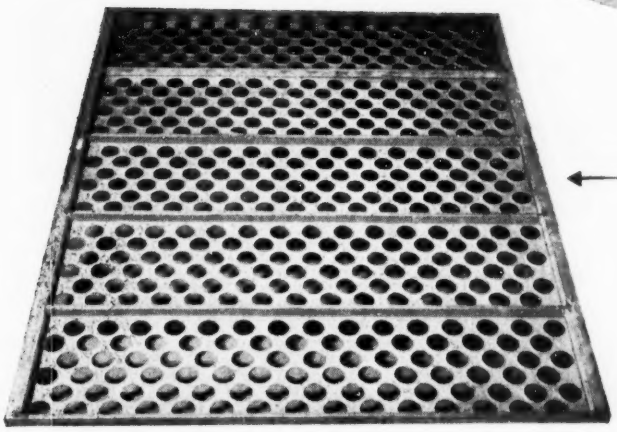
PROCEEDINGS OF THE PRESIDENT'S CONFERENCE ON INDUSTRIAL SAFETY, JUNE 2-4, 1952. *U. S. Dept. of Labor, Washington 25, D. C. Bureau of Labor Standards, Bulletin No. 159. 183 pages. Includes text of all papers presented at the conference, committee reports, conference organization, and conference delegates.*

SANITARY MILK CONTROL AND ITS RELATION TO THE SANITARY, NUTRITIVE, AND OTHER QUALITIES OF MILK. *National Research Council, Publication 250. Available from N.R.C., 2101 Constitution Ave. N. W., Washington 25, D. C. Reports 1950-51 study of effects of various sanitary regulations on quality of fluid milk marketed in eight different cities (first phase of this project was reported as N.R.C. Bulletin 121 of July 1950, "Sanitary Milk and Ice Cream Legislation in the United States").*

These recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated, the pamphlet is free and should be ordered directly from the Bureau responsible for its issue.

TRUCKS HAUL INCREASED SHARE OF FRUIT AND VEGETABLE TRAFFIC; SELECTED FRESH FRUITS AND VEGETABLES, 1948 *and* 1951. *Bureau of Agricultural Economics, USDA, Washington 25, D. C. 24 pages. Compares rail and truck traffic in two recent years, suggesting that increased railroad freight rates have probably encouraged diversion of rail traffic.*

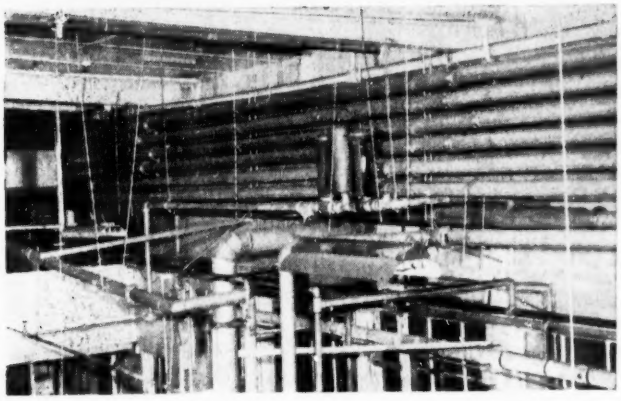
What's Your Problem?



This Company Couldn't Keep Fruit from Jumping

This company wanted to make a fruit selector with special sides—to keep apricots, peaches, etc. from "jumping out" as they were sorted.

And Carpenter came up with the answer . . . Type 304 Stainless Tubing in a special trapezoid shape. The slant on the inside of the tubular frame keeps fruit in the selector while it is graded, according to the sizes of holes in the selector.



This Processor Wanted to Safeguard Purity while Blanching Baked Beans

Quite a different problem . . . but again Carpenter "filled the bill".

This blancher contains over 800 feet of 4" Carpenter Stainless Tubing. It not only safeguards purity but also effectively resists corrosive action of the blanch water.

From jumping fruit to baked beans . . . Carpenter Stainless Tubing helps to make life pleasanter and more profitable for food processors.

What's your problem? We'll be happy to go to work on it. Just drop us a line or call your nearby Carpenter distributor.

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Carpenter

STAINLESS TUBING & PIPE

Analysis · Tolerance · Finish

- guaranteed on every shipment

For more information, use coupon on page 159.

RICHARDSON

PROVIDES
SPEED
AND
AUTOMATIC QUALITY CONTROL

...*for the* MURRAY COMPANY (Division of H. A. Johnson Co.)

PROBLEM:

High labor charges and uncertain accuracies in loading sugar to syrup kettles presented a challenge to the cost- and quality-conscious management of the H. A. Johnson Co.

SOLUTION:

A suitable conveyor system feeding a Richardson Automatic Scale provided high volume, controlled accurate flow of sugar to the cookers. Another alert management had reduced their labor charge to practically nil and incorporated machine-made, repetitive accuracy into their process.

Rising labor costs *can* be offset while still maintaining both quality and quantity production. Proof of this is the Richardson installation pictured, recently completed for the Murray Company, Division of the H. A. Johnson Co., Boston, Mass. Adopting the recommendations of a Richardson field engineer, this well known manufacturer of soda fountain syrups and toppings has actually increased output at reduced unit cost. At the same time product quality is now rigidly controlled, *automatically*.

Materials handling by weight has been a Richardson specialty for more than fifty years. And every year has seen more practical applications throughout the processing industries of this wide range of experience.

At no obligation to you, a Richardson engineer will gladly call, survey your present methods, and show you the Richardson way to lower costs through efficient materials handling by weight.

Richardson

MATERIALS HANDLING BY WEIGHT SINCE 1902

Richardson Scale Co., Clifton, New Jersey. Automatic Weigher Systems of All Types: Automatic Bulk Weighing Hopper Scales, Including Conveyor-Feed Types • Continuous Feeder-Weighers • Automatic Bagging Scales • Bag Sewing Conveyors Packers • Multi-Material Proportioning • Process Control Panels. *Branch offices in:* Atlanta • Boston • Buffalo • Chicago • Detroit Houston • Minneapolis • New York • Omaha • Philadelphia Pittsburgh • San Francisco • Wichita • Montreal • Toronto.

KEEPING UP WITH THE FIELD

Technical News • Washington Highlights • Economic Trends • Labor Developments

Radioactive Test of Fruit

Research by radioactive means on chemical changes taking place in apples during storage may lead to improving the keeping quality of fruits.

Investigated was the CO_2-fixation process—involving recombination of respiration products into plant acids and other compounds required by the fruit to maintain its life activities.

Radioactive CO_2 was used by three Canadian chemists, who reported at the recent convention of The Chemical Institute of Canada that the fruit process occurs at a significant degree during storage.

Target Frozen Nutrients

More than 15,000 nutritional values from some 30,000 frozen food packages will be determined by the Wisconsin Alumni Research Foundation in the first phase of the five-year nutrition research program of the National Assn. of Frozen Food Packers.

A second phase calls for studies at various universities on development of handling methods for assuring maximum retention of nutrients.

Well over $200,000 has been jointly subscribed by allied industry and the Association in support of the program.

Fish Flour Developed

Recently exhibited to UN delegates were samples of a brownish fish flour, reported palatable and completely free from a fishy odor or taste. Developed in South Africa, it was brought to the attention of the International Children's Emergency Fund by UN's Food & Agricultural Organization.

Plans are underway to introduce the flour—high in protein—in countries short of milk. Tests have indicated that it might be added to cereals or baked into bread or biscuits.

Smoked, Pickled Olives

Newly reported is a process for smoked pickled ripe olives. Developed by Prof. E. V. Cruess, University of California College of Agriculture, it includes pickling of ripe olives in usual manner, treatment on trays in dense oak or hickory smoke for about 1 hr., then canning and sterilizing.

Candymen Weigh Problems, Methods

Methods of controlling candy quality received the spotlight at the 70th Convention of the National Confectioners' Assn. in New York:

On Antioxidants—Vegetable fats do not, animal fats do, require stabilization against oxidation, reported L. F. Martin, Sugarcane Products Div., USDA, New Orleans.

Used at 3-percent level, two natural ingredients—yeast and oat flour—prevented rancidity of animal fats incorporated into candies.

Cost Savings—Control laboratories have brought the following benefits declared R. W. Watson, Sears, Roebuck & Co.: (1) A 25 percent increase in production through formula improvement. (2) greater production with less scrap by setting "specs" for raw materials and then checking them, (3) 10-25 percent cost savings by testing colors and flavors, and (4) a curbing of infestation spoilage losses by a sanitation program.

Output and Labor—Man-hour output—has "upped" only 23 percent from '39-'51, E. A. Terry, Wallace & Co., Brooklyn, pointed out. But labor cost per pound has gone up 97 percent and hourly wage rates have jumped to 144 percent.

Cocoa Headache—Since the end of World War II, world consumption of Cocoa stayed abreast of production, and at no time has there been an opportunity to create a surplus, said S. Y. Coyne, New York Cocoa Exchange. He indicated that future prospects do not look too bright.

Weigh Likely Substitutes For Rejected Coumarin

Following voluntary withdrawal of coumarin from sale for food-flavor uses (June FE, p. 236), a number of inquiries have been received by FDA as to substitute use of ethyl vanillin.

Another possibility is increased employment of natural vanilla.

Withdrawal resulted from action of four coumarin manufacturers, whose representatives visited FDA on May 19 with a report of pharmacologic research that had raised a question as to safety of coumarin.

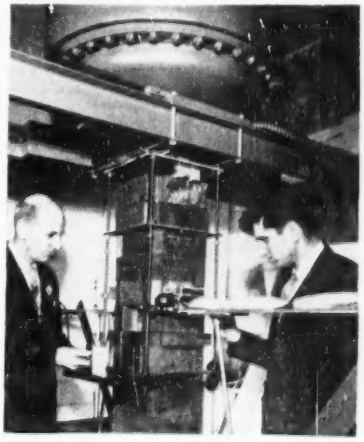
Though no harm has been shown in humans, oral toxicity occurred in male weanling rats at approximately 0.5g. per kg. of rat weight when coumarin was dissolved in propylene glycol. Figure was given as 0.75g. when dissolved in corn oil, and toxicity was said to occur more slowly.

Autopsies of rats that survived single oral doses in the range of 0.3g. all showed extensive mottling and spotting throughout most of the surface of the liver.

Subacute feedings—0.1 and 0.02 percent—had been continued for four weeks at time of report. And although food consumption was comparable for these two groups and the control group, growth retardation was apparent at both levels of coumarin feeding.

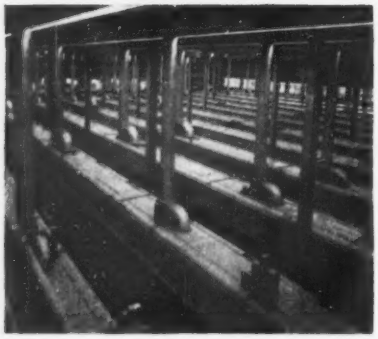
Autopsy of rats succumbing to lethal doses revealed liver changes; blood was revealed in the bladder, and the pancreas and mesenteric nodes were hemorrhagic.

Feeding a proposed new flavor containing 20 percent coumarin at a 1.37 percent level for 30 days produced significant weight losses in the rats. When fed at a level of 0.27 percent, two of a group of 10 rats died, and two more had possible gross liver damage at terminal autopsy. No untoward effects resulted from feeding at a level of 0.027 percent.



Ray-Barraging Foods

Beltline sterilization of products by cathode rays is under probe at G.E.'s Milwaukee lab. Unit packs 1,000,000v. Tests may be arranged by processors.



New Mammoth Bakery

Acclaimed as largest, most modern biscuit and cracker bakery, new Chicago facility of National Biscuit Co. is designed to capacity of 60 million crackers during an 8-hr. shift. Featured are straight-line production techniques, with key to operations being these dozen big 300-ft. ovens. Crackers are carried through by steel bands and baked enroute by gas burners.

Quality Ripened Tomatoes By "Sparing the Ice"

The range of 60-65 deg. F. has been determined as ideal for maintaining quality of tomatoes that are ripened after harvest. This finding is reported by USDA plant researchers, who made extensive lab tests and studies of tomatoes shipped cross-country from Texas, Florida, and California.

Shippers are advised, therefore, to use less ice than the amount commonly required by other fruits and vegetables, with the judgment based largely on the temperatures of the tomatoes when loaded and to a lesser degree on outdoor temperatures in transit.

Noting that tomatoes are damaged by low temperatures that would be quite suitable for many other goods, W. Pentzer and L. McColloch, of the Plant Industry Station, Beltsville, Md., state that chilling injury causes losses in tomatoes held at 32 F. for six days or at 40 F. for nine days.

Further, it becomes more serious with longer exposure, showing up in slow ripening, poor flavor, development of alternaria rot, and pale or mottled color.

On the other hand, temperatures above 70 F. favor development of certain types of decay, especially the loft rots. And such high temperatures also retard ripening and cause the fruit to turn yellow instead of the typical tomato red.

Animal-Fat Tin Plating

With only slight modification, such animal fats as lard, tallow, and white grease make satisfactory tinning oils for "hot-dip" tin plating of steel sheets. Thus, they may be substituted for the imported palm oil that is now employed.

Three important advantages are seen: The new oil would be cheaper; its use would create a ready market for surplus fats; and problematical dependence on imports during emergencies would be reduced.

The discovery is credited to Armour Research Foundation of Illinois Institute of Technology, working under USDA contract in collaboration with Eastern Regional Research Laboratory.

Beliefs on Diets for Aged Discounted by Research

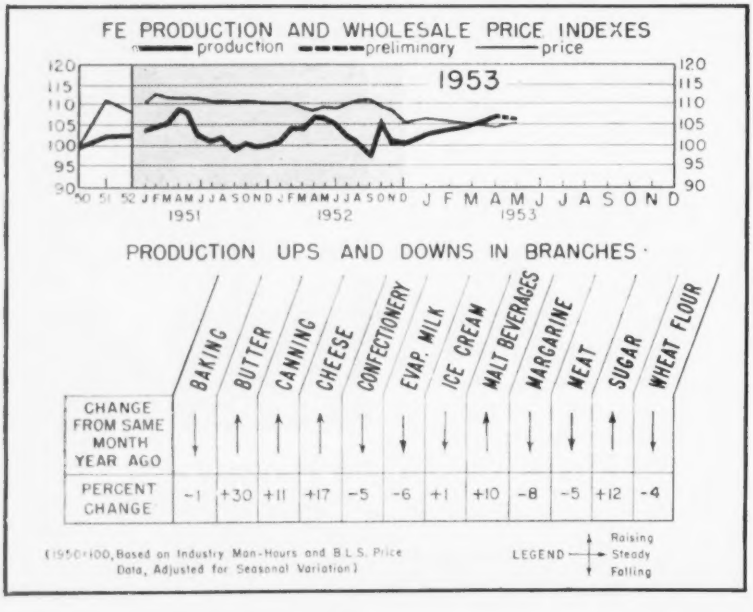
Requirements of dietary protein by persons over 65 is about a third less than for younger adults. Other than this, many dietary limitations popularly thought necessary in feeding the aged have no basis in fact. So reported Dr. Anthony Albanese, chief, nutritional reseach, St. Luke's Convalescent Hospital, Greenwich, Conn., at the recent meeting of the New York Section, IFT.

Current research, he said, refutes the idea that the elderly should avoid fats in an effort to slow hardening of the arteries. Also, no scientific justification is seen for such persons specifically curtailing sugar intake.

Dr. Albanese finds "little or no evidence" that cholesterol blood levels are related to arteriosclerosis. Thus he discounts moves to reduce cholesterol by cutting down on eggs, milk, cheese, and the like. Contrary to a low-fat diet for older persons, a diet slightly higher in fat may be more suited, considering body changes.

Study of diets that the elderly healthfully selected for themselves led to the conclusion that those over 65 probably require from 20 to 30 percent less dietary protein than the National Research Council specifies for average adults. Exception is during convalescences calling for restoration of protein stores.

Recommendations on curbing carbohydrate intake were termed most fanciful by Dr. Albanese. He said they failed to acknowledge needs of the balanced diet.



Associates Elect

A. N. Prater has been elected president of The Research & Development Associates, Food & Container Institute, which works with QM in the solution of military food problems. Dr. Prater is technical director of the Gentry Div., Consolidated Grocers Corp.

Other officers named at 6th annual meeting of Associates: Chairman of Board, Harry Williams, v.-p., Wilson & Co.; Vice-Chairman, C. W. Kaufman, v.-p., Kraft Foods Co.; Executive Vice-President, Roy Walters, director of research, General Foods Corp.; Vice-President in Charge of Activities Committee, James F. Hale, research director, Borden Food Products Co.

Continuing as Treasurer and Secretary, respectively, are F. D. Long, technical director, Container Corp. of America, and Col. Rohland A. Isker.

To Make "1-to-5" Juice

Florida citrus processors will soon produce a "1-to-5" citrus concentrate, packed in 32-oz. cans for sale only to institutions, the armed services, and dispensers in order not to confuse the general public, which has grown accustomed to the 1-to-3 ratio of reconstitution with water.

This action will follow approval of a bill passed by the state legislature permitting such packing under citrus code regulations. The new product must be not less than 58 or more than 60 deg. brix. Proponents declare it will have better keeping qualities at high temperatures without impairment of flavor than the 1 to 3.

Hors d'Oeuvres

▶ **Both inebriation and sickness from atomic radiation are treated with vitamin B_6. Alcohol and A-bombs seem to have something in common.**

▶ Southwestern cotton farmers are using geese to eat the weeds out of cotton fields. So the farm laborer's goose has been cooked by geese.

▶ **Butter blended with margarine recently went on test sale in St. Louis. One way to sell more butter.**

▶ We should quit stewing about the huge butter surplus and take the advice of the **New York World Telegram**: "Eat more butter. You may as well, because you have to pay for it anyway."

▶ **USDA considered it news that honey was to be supported again this year. We thought it was an old American custom.**

▶ Baby-picture booklets with recipes are promoting meat sales. Should give housewives ideas—for meat dishes, that is.

▶ **Meat-fed infants suffered 40 percent fewer infectious illnesses, according to a two-year study at Loyola University. Looks like the cost of feeding babies is going up.**

▶ Asparagus contains some vitamin C, is a good source of thiamine and riboflavin, but has only 26 calories per dozen spears. Now you "robust" fellows know what to eat.

▶ **"Science Fun With Milk Cartons" is a new book on how to make toy gadgets out of empty milk containers. Now dad too can enjoy junior's milk.**

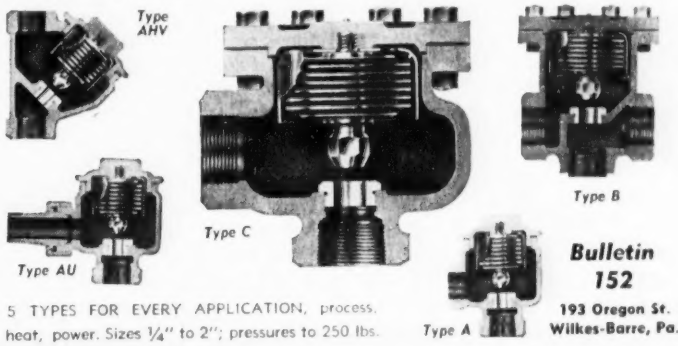
▶ Popcorn production increased 23 percent last year. Who said that movie attendance was declining?

▶ **One physician says that if everything for preserving human life were utilized, many would attain the century mark. Could be there's a good future for Senior's Shredded Spinach.**

Nicholson Steam Traps

CUT HEAT-UP TIME 48%

A large processor recently reduced the heating cycles of cookers from 105 min. to 50-60 min., by substituting Nicholson thermostatic steam traps for a mechanical type. This effected a gratifying production increase of 37%. Reasons for Nicholson's faster heat transfer: operate on lowest temperature differential; 2 to 6 times average drainage capacity; maximum air venting. To learn why an increasing number of leading plants are standardizing on Nicholson thermostatic traps send for our catalog.



5 TYPES FOR EVERY APPLICATION, process, heat, power. Sizes ¼" to 2"; pressures to 250 lbs.

Bulletin 152

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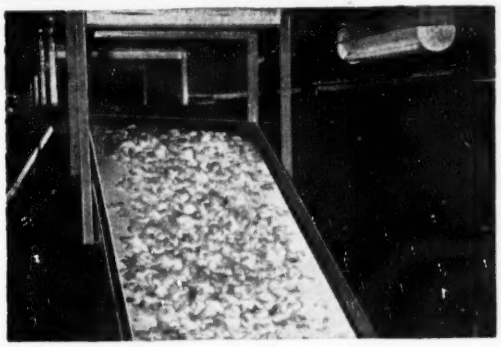
W. H. NICHOLSON & CO.

TRAPS · VALVES · FLOATS



SUPRENE BELTING...

Likes Having Its Face Washed!

Wherever cleanliness is a factor . . . in cleaning fruits and vegetables, in the manufacture of biscuits, crackers, bread, candy and cheese . . . *sanitary, Suprene Belting is always in demand!* That's because it's so easy to keep clean! . . . washes like new with steam or hot water.

A superior cotton duck belt, Neoprene impregnated, it is highly resistant to the corrosive action of fats, greases and fruit acids. Odorless, tasteless and waterproof, Suprene Belting offers years of safe and sanitary conveyance. Available in a variety of plies and four styles to meet all your food handling requirements. Send for Bulletin 20.

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Wyandotte has proved products for equipment cleaning, *germicidal* treatment, bottle washing, maintenance cleaning — *everything* that is so important to sanitation.

These products, used by all types of food processors— packers, bakeries, dairies, confectionaries, breweries, canneries—are backed by Wyandotte, the world's leader.

They not only do a better job, *but save you money as well.* With the help of Wyandotte Field Service, you can actually cut down the number of different types and kinds of products used. You can avoid big inventories, save valuable storeroom space, save money, too!

Call in one of Wyandottes' cleaning experts today. He will show you how easy it is to have a planned cleaning program; or mail the coupon below.

Wyandotte Chemicals Corporation
Wyandotte, Michigan

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"Frozens" Run X-Country In Reefer-Truck Test

Feasibility of transcontinental motor-truck shipments of frozen foods at well-below-zero temperatures was demonstrated in a recent test run. Supervising the experiment were representatives of the Marketing & Facilities Research Branch of the Production & Marketing Administration, USDA.

Test goods carried were frozen turkeys. They were loaded at Modesto, Calif., Nov. 23, 1952, at a temperature of 16 deg. F. below zero. And they were delivered in Medford, Mass., eleven days later, at a temperature of 13.4 deg. F. below zero.

Enroute, minor mechanical difficulties with the trailer refrigeration system at one time permitted cargo temperature to rise to about 3 deg. F. below zero, but this did not alter condition of the shipment.

In the arrangement of the late-model refrigeration equipment employed, engine, generator, compressor, and condenser were combined into one assembly and mounted under the trailer. Once started, the engine ran continuously. Refrigeration was controlled by modulating its speed.

Unit operated at high speed—1,900 rpm.—until air temperature inside trailer reached the desired level. Thermostatic control then reduced engine speed to 1,100 rpm., at which rate it operated until trailer air temperature rose sufficiently to actuate the thermostat. Cycling from high to low speed provided constant control within plus or minus 2 deg. F. Defrosting of the evaporator coil was accomplished by manual switches on the compressor control panel.

Outside temperatures during trip ranged from 37 to 87 deg. F. Although in extreme mid-summer heat, warmer load temperatures would be expected, it is doubtful they would be high enough to nullify the refrigeration performance. However, further tests under summer conditions are indicated.

Economic factors of such runs were not considered here. A detailed report on the study is available from the Marketing & Facilities Research Branch.

Briefly . . .

● **BARLEY TRICK: Treatment making barley look much like rice when cooked, thus promoting its use in Nipponese diet, has been developed in Japan—thus leading to greater barley imports. Canada particularly eyes this market.**

● MEAT EATING in U. S. is expected to be highest this year since '47, with beef consumption loftiest since '09. Total year intake of all kinds per person is seen reaching 145 lb.

● **FRUIT-FREIGHT speed records, California-Chicago, are being set by Santa Fe's new No. 62 train, which negotiates the run in a fast-clip 62 hr. This compares with over 100 hr. for regular freight. Some of traffic lost to trucks is seen being recovered with this two-day-shorter transport. Union Pacific plans a similar service.**

● SURPLUS FOODS. Need for a far-reaching program to educate peoples of Europe and Asia in the use of surplus American food products, particularly wheat, was stressed in a recent meeting of President Eisenhower with Nathan C. Cummings, board chairman of Consolidated Growers Corp., Chicago.

● **EXECUTIVES of food firms were active in recent conference of American Management Assn. Curtis H. Gager, v.-p. and director, General Foods Corp., spoke on "Insuring Company Growth Under Changing Conditions." Lee S. Bickmore, v.-p., sales, National Biscuit Co., was panel speaker on marketing in program "How Major Company Functions Are Being Geared to Economic Trends." And John M. Fox, president, Minute Maid Co., was chairman of meeting concerned with "Top Management's Role in Executive Development."**

● COMPANY RISE of Kraft Foods, celebrating 50th anniversary: From a mere single-horse delivery service in '03 to 1,400 salesmen and 1,200 delivery trucks in '53. Firm now has cheese plants in 23 states, 9 cheese and salad facilities in Canada, 3 in England, 12 in Australia.

● **SAFETY RECORDS in '52 of 13 Swift packing plants have been honored by National Safety Council. Top performance: North Portland plant's lost-time injury frequency rate—a striking low of only .7 per million man-hours.**

● 100 YR.: Hailed by The Borden Co. is hundredth anniversary of Company Founder Gail Borden's discovery of condensed milk. Patent for product granted by Queen Victoria is a feature display.

● **CANS: High production of base-metal ores near Bathurst, New Brunswick, gives possibility of introduction of large-scale can manufacturing in Canada.**

● PILOT PLANT for food processing research and teaching on Davis Campus, University of Calif., has been expanded with more than $100,000 worth of canning equipment, most of it donated by industry.

● **SUGAR: New sugar refinery at El Tocuyo, Venezuela, will go into production in Jan. 1954 at minimum rate of 800 tons of cane per day. A second refinery, at Motatan, is also slated to get underway in '54.**

A-Tracers Gage Cleaners In New Research Lab

Here in new "last word" research building recently opened by Wyandotte Chemicals Corp., Wyandotte, Mich., nucleonics technician checks performance of a cleaning agent by getting Geiger count on a machine part which had borne soil tagged with radioactive tracers. Lower the count the more soil removed—hence the better the cleaner. And so most efficient sanitation materials will be determined for use in food processing and handling establishments.

Work of a staff of more than 200 is especially directed to developing means of improved sanitation. Operations are directed by Dr. Thomas H. Vaughn, vice-president of research and development, with work of particular concern to food industry being supervised by Dr. L. R. Bacon.

Food technology department has dish-washing units, three large walk-in incubators for the well-equipped microbiological section, and a special inoculation room with all necessary facilities for general bacteriological studies.

Further notable is fact that entire building is designed as a permanent "maintenance cleaning project." To this effect, one hallway has 14 different kinds of flooring being subjected to continuing "in-use" checks.

India Devises New Foods

Several developments aimed at ameliorating the pressing need for adequate food supplies in India are reported achieved at the Central Food Technological Institute in Mysore.

Among technological strides is the making of custard powder and starch from previously useless banana stems. Also, the cashew "apple" (part to which nut is attached) has been variously utilized in producing a flavorful cordial, a squash-like food, a pickle, a jam, and a confection.

Other new foods include a rice-like product prepared from tapioca and groundnut. It is stated to be 25 per cent cheaper than rice while being just as nutritive. And further in the fruit line are powdered juices reputedly high in natural vitamins and flavor and boasting good shelf-life.

In addition, new treatment of jute with chemicals is stated to show promise in making bags of this material insectproof.

High Toll of Unwise Eating

Shorter lives, handicapped health, and destructive diseases are the lot of some 20 million Americans because they consistently eat and drink unwisely. So said Dr. Charles Glenn King, scientific director of The Nutritional Foundation, Inc., at the body's recent board meeting in Chicago. Meanwhile, only about one-fourth of the population follows a good diet, he added.

This condition exists, continued Dr. King, despite the fact that the nation has enough nutrients to furnish ideal diets for all, resources to bring them within reach of nearly everyone, and high industry standards protecting quality of foods.

Wider nutritional education, deeper research, and more professional workers are proposed to gain health improvements. The Foundation study grants since '42 have reached $3 million, and food and related industries have contributed $5 million.

New Outbreak of F&M

Imports of livestock and fresh meat from Mexico have been banned as the result of a fresh outbreak of foot and mouth disease at Gutierrez, Zamora, Vera Cruz, on May 23.

The border was officially reopened last Sept. 1 (following quarantine as the result of a similar outbreak near Nautla, Vera Cruz in Aug., 1951). Since that time some 72,000 cattle have been imported from Mexico, though not from the quarantined zone.

Eradication commission workers had remained alert in the interim.

Direct Pineapple Vinegar

World's first commercial plant to produce vinegar straight from pineapple juice is planned by Philippine Packing Corp., subsidiary of California Packing Corp. Now set up in Mindinao is a 15 gal./day pilot plant. CPC has been distilling a brandy-like intermediate product from excess pineapple juice. This serves as raw material for fermentation of vinegar, but direction production is believed unique.

Food Processor Attains Maximum Cleanliness

Mr. Philip P. LaRosa of V. La Rosa & Sons, Inc., processors of Grade A Macaroni Products, Brooklyn, New York, states use of bucket and screw conveyors driven with Slo-Speeds produces a high degree of cleanliness and purity of product, gives dependable, uninterrupted service, requires low maintenance. Slo-Speeds require minimum installation space, are easy to keep clean due to streamlined design.

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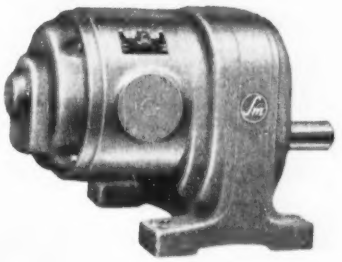

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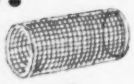

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Most likely the type of special wire cloth assembly you use has been built in our plant. Our factory men can work from your specifications, or our Engineering Department can draw up working prints and specs based on merely your description of what the part must do. Why not let us quote the next time you need special wire cloth forms?

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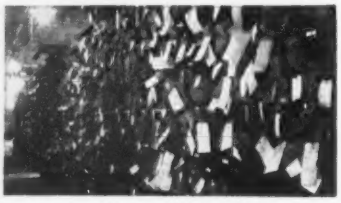

We can also supply you with wire cloth in bulk for your own fabrication. Many common types are ready for immediate shipment from stock. And if your order needs special production, we'll schedule our looms to have the material in your plant without delay. We can weave in any metal or alloy and in sizes from 20 x 250 mesh up to 4" openings.

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OFFICES IN PRINCIPAL INDUSTRIAL CITIES

Youngsters Underfed

"We've failed our 'teen-agers in food."

That is the disturbing and challenging conclusion of a comprehensive 10-yr. nutritional study of 2,536 youngsters 13 to 20 yr. of age.

Part of Pennsylvania's mass studies in human nutrition, survey made clear that the average 'teen-ager is very often underfed and undernourished. Relatively small percentages of boys and girls consume recommended levels of basic nutrients, as indicated by the following figures:

	Boys	Girls
Calories	22.9	28.5
Protein	56.8	47.4
Calcium	48.9	38.4
Phosphorus	67.1	57.9
Iron	50.6	25.7
Vitamin A	47.4	36.6
Thiamine	35.3	29.6
Riboflavin	57.6	48.4
Niacin	48.4	52.7
Vitamin C	50.3	52.4

Results of this survey were announced recently by Dr. Pauline Beery Mack at an official presentation held by Lever Brothers Co., donor of a grant-in-aid contributing to the study.

Your Foremen Gaged?

Need is indicated for better job evaluation in the middle management brackets, according to the National Foremen's Institute, New London, Conn.

Salary data it has compiled in a pilot survey reveal a range from less than $300 a month to over $700 among manufacturing-field Class I foreman (directorial responsibilities: 37 subordinates, average), with 48.1 percent earning between $450 and $525. In contrast, 80 percent of those in Class II (monitor-type responsibilities; 22 subordinates, average) get between $375 and $450.

Comparison of duties reflects the differences in earnings. However, says the report, "the job title, foreman, is apparently all things to all men," showing much is still to be done in commensurately defining and standardizing responsibilities.

Cereal-Milling Advance

A method of accurately measuring and controlling temperature difference of stock being processed through roller mills has recently been developed by Atkinson Milling Co., Minneapolis.

This firm found that amount of roll pressure directly relates to the temperature difference between incoming and outgoing stock and the rate of extraction. Hence, instruments were adopted to aid in control. Hitherto, manual testing has been customary when setting rolls—checking of granulation and temperature of stock by "feel."

Now each pair of rolls has three devices that measure temperature difference of stock, thus giving an indication of the extraction. Measurements also serve as a check on uniformity of grinding.

Keeps Out Water

Through treatment with an aqueous solution of the sodium salts of certain silanols, many materials can now be made water repellent. Here, a section of magnesia pipe covering (right) subjected to a 5 percent solution of the new agent floats for days, whereas an identical untreated section (left) sinks within 15 min. Called XS-1, new material is made by Dow-Corning Corp.

USDA Grade Standards

Recent actions by Production & Marketing administration of USDA on U. S. Grade Standards and related activities include the following:

Frozen cooked squash, new, proposed, p. 2791, May 14 *Federal Register*. Written comments received until June 13.

Frozen asparagus, revision postponed, p. 2793, May 14 *Federal Register*. "Further work with the industry in the various producing areas is desirable before proceeding with the proposed amendment," which appeared on p. 1692, Mar. 25 *Federal Register*.

Canned sweet cherries, correction, p. 2969, May 23 *Federal Register* (correcting typographic error on p. 2073, Apr. 14 *Federal Register*).

Canned blackberries and other similar berries such as boysenberries, dewberries, and loganberries, revised and new, p. 3085, May 29 *Federal Register*. Effective June 28.

Tomato sauce, new, proposed, p. 3096, May 29 *Federal Register*. Written comments received until June 28.

Frozen succotash, new, p. 3247, June 6 *Federal Register*. Effective July 6.

Canned whole kernel corn, revised,

Suppose we put the Dempster-Dumpster System right down in your plant . . . then what?

● *Well First—let's make it clear that we are furnishing you with several sizes of different designs of 26 containers to suit your materials requirements. Then bear in mind that we are delivering you only one truck-mounted Dempster-Dumpster and with your driver this one outfit picks-up, hauls and dumps all containers, about like the one shown above.*

Now, how many conventional trucks are you using for handling rubbish, scrap, raw materials, and what have you?

For several years now, one plant has been doing considerably more work with two Dempster-Dumpsters and two men than they did with five trucks and fifteen men before the Dempster-Dumpster System was installed. You can guess at the approximate savings annually.

A glance at the picture below and you get the whole story of the Dempster-Dumpster System. Never before have you been able to cut bulk materials handling costs so drastically.

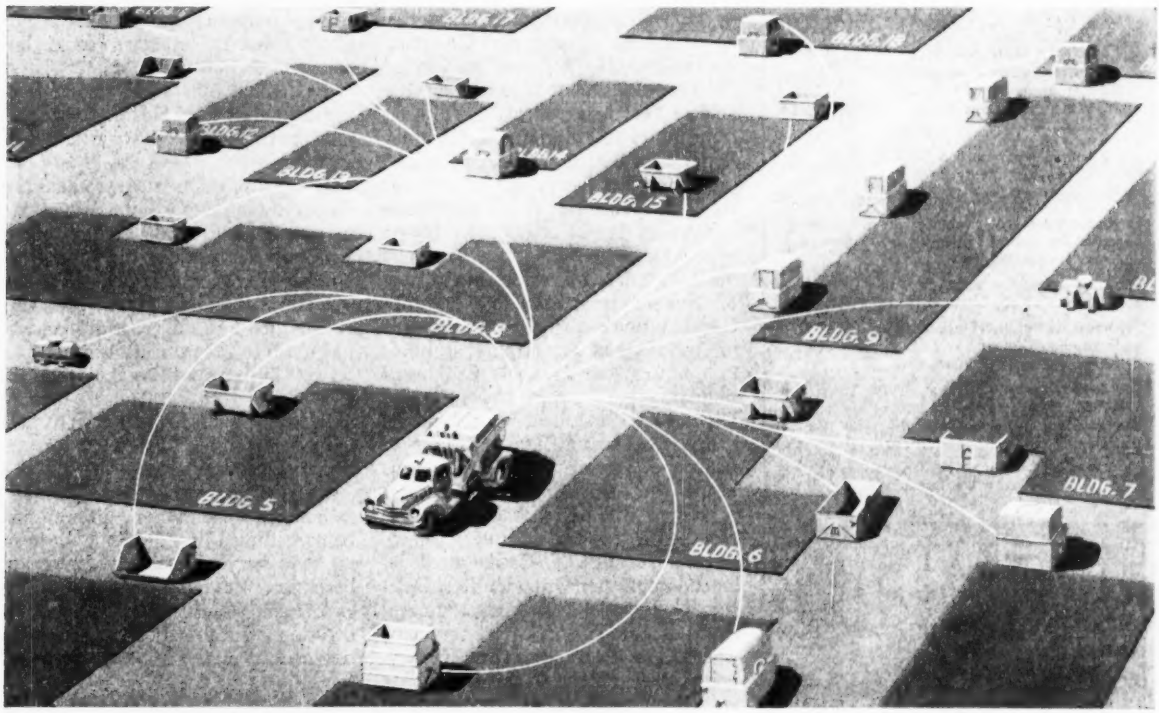
One truck mounted Dempster-Dumpster handles the entire group of 26 Dempster-Dumpster containers. These big, detachable steel containers are like having 26 truck bodies for a single truck.

Any required number of Dempster-Dumpster containers are spotted at convenient materials accumulation points inside and outside your buildings. They range in sizes up to 12 cu. yds.—3 to 4 times the capacity of a regular dump truck. Materials—bulky, light, heavy, solids, rubbish and even liquids—are dumped or placed into these containers.

The truck mounted Dempster-Dumpster makes scheduled rounds, picks up each preloaded container, carries it to the point of disposal, sets it down intact or dumps the materials and returns the container for refilling. The entire operation is hydraulically controlled and handled by your truck driver.

It's as simple as we have described it. The amazing thing is the tremendous savings being made by the Dempster-Dumpster System in hundreds of leading industrial plants over the nation.

A product of Dempster Brothers, Inc.



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PALMER

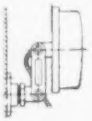
MERCURY ACTUATED

Dial Thermometers now in three types to suit any requirements

Full 4½" dial face. Stem can be placed at any angle and case can be rotated to any readable position.

1 **Rigid Stem Dial Thermometer** tapered bulb, interchangeable with standard industrial thermometer separable socket. (As illustrated above.)

2 **Wall Mounted Dial Thermometer** with flexible connecting armor. Case adjustable to easy reading position.



3 **Flush Mounted Dial Thermometer** for panel mounting with flexible connecting armor.

All three types have a full 4½" dial face.

for accuracy: Mercury actuated . . . Fully Compensated by Invar Compensaton. Guaranteed Accurate 1 scale division.

for angularity: Can be adjusted to most readable position at any angle desired.

for readability: Bold Black Numbers . . . 11" of scale Reading Dial face can always be placed in easiest readable position.

for interchangeability: Always specify "PALMER" Separable sockets as they are interchangeable for Dial or Industrial type Thermometers.

Send for Bulletin 51-129 for details on the New Palmer Dial Thermometer.

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proposed in a May 11 announcement by USDA, and revoked in a May 15 announcement. No printing of proposed revision appeared in *Federal Registry*. "Pending further study of objective methods of determining tolerances for defects, the present grade standards will continue in effect."

FDA Food Standards

Congressional Hearings: Simplification of food standards proceedings suggested by Representative Hale (R., Me.) is among the bills likely to be heard soon by the House Interstate & Foreign Commerce Committee. Other proposed food and drug legislation awaiting hearing includes two bills each by Representatives Delaney (D., N. Y.) and Miller (R., Neb.) on use of chemicals in foods and cosmetics, and one by Representative O'Hara (R., Minn.) on imitations of standardized foods. Hearings were held in late May on the restoration of factory inspection authority for FDA, with a surprisingly large number of witnesses appearing to testify, many of them favoring "modifications" in the wording of the bills introduced at the request of Secretary Hobby. As this issue went to press, however, no report had yet been issued and no hearing dates had been set for the other pending bills. (Also see editorial, FE June, p. 160).

Budget for FDA in fiscal 1954 was reduced $648,000 (about 10 percent) by House Appropriations Committee in early June. Committee Chairman Taber (R., N. Y.) was critical of FDA's enforcement activities in the field of "economic cheats" as distinct from purity and cleanliness. Commissioner Crawford stated that the FDA inspection staff would have to be cut about 25 percent if the Committee's budget cut is not restored by House or Senate action. No reference was made to reduced activities in the field of food standardization.

Court Actions: Eighth Circuit Court of Appeals had requested that briefs in the Research Products Co. bread standard case be filed by June 20. Date of oral argument on the merits of the case has not yet been set.

Second Circuit Court of Appeals heard the margarine standard case argued in mid-May. A decision was expected by the end of June.

Future Hearings: 1. Cacao products, amendment, standard identity. Deletion of optional ingredient coumarin from a number of cacao products, which have been standardized for several years, is expected soon. A hearing may be announced any day; initiative of Secretary. (Also see item, p. 189.)

2. Salad dressing, rehearing (ordered Mar. 1951 by Third Circuit Court of Appeals), standards of identity; "skim milk and milk products" proposed as optional ingredients. FDA gathering data; no hearing date set yet.

3. Process cheese food, amendment (requested by manufacturers in early 1951), standard of identity; skim milk cheese proposed as optional ingredient. Hearing expected soon, but date not set yet.

4. Canned tuna, new, standards of identity and fill. Hearing expected soon, but no date set yet; initiative of Secretary.

5. Catsup, amendment, standard of identity. National Canners Assn. has requested addition of corn syrup as an optional ingredient; hearing announcement expected soon.

6. Canned salmon, new, standards of identity and fill. Field work by FDA still in progress; no hearing date set yet; initiative of Secretary.

7. Canned sardines, new, standard of identity. Field work by FDA still in progress; no hearing date set yet; initiative of Secretary.

8. Beverages, new, both still and carbonated. Preliminary information being gathered by FDA, but no hearing date set yet; recent appearance of beverages containing non-nutritive sweeteners for dietary purposes may occasion official action sooner than originally planned; initiative of Secretary.

9. Frozen vegetables, new, probably only peas and asparagus at first. Another season of experience will

Schedule of Events

July

9–10—National Kraut Packers Assn. annual meeting; Catawba Cliffs Beach Club, Port Clinton, Ohio.

16–17—National Pickle Packers Assn. Summer meeting; Drake Hotel, Chicago.

20–24—Conference on Microbiological Deterioration (Amer. Assn. for Advancement of Science); New Hampton School, New Hampton, N. H.

27–30—Metropolitan Candy Brokers Assn. Confectionery & Allied Products Exposition; Hotel Commodore, New York City.

27–31—American Oil Chemists' Society edible oil short course; Texas A&M College, College Station, Tex.

August

10–13—International Apple Assn. annual meeting; Chicago.

10–14—Conference on Food & Nutrition (Amer. Assn. for Advancement of Science); Colby Junior College, New London, N. H.

24–26—Canadian Institute of Sanitary Inspectors Dominion Convention; Vancouver, B. C.

September

1–3—International Assn. of Milk & Food Sanitarians; Michigan State College, East Lansing.

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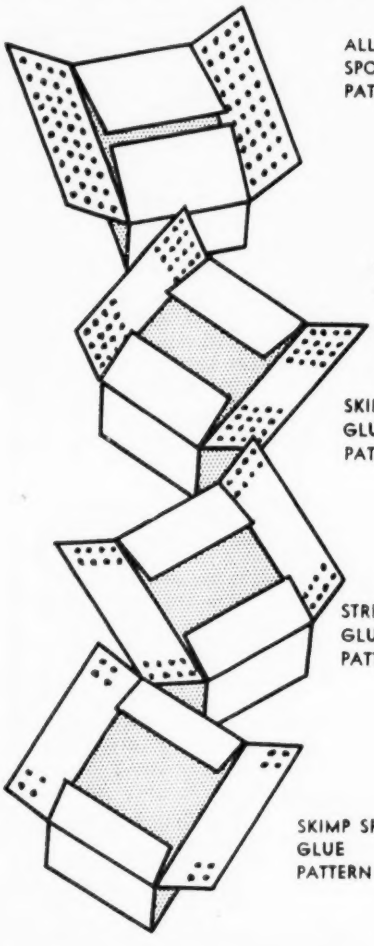
THE ONLY ALL NEW SHORT CASE SEALER

Applies glue and seals all types of paper cases

APPLIES GLUE IN SPOT PATTERNS

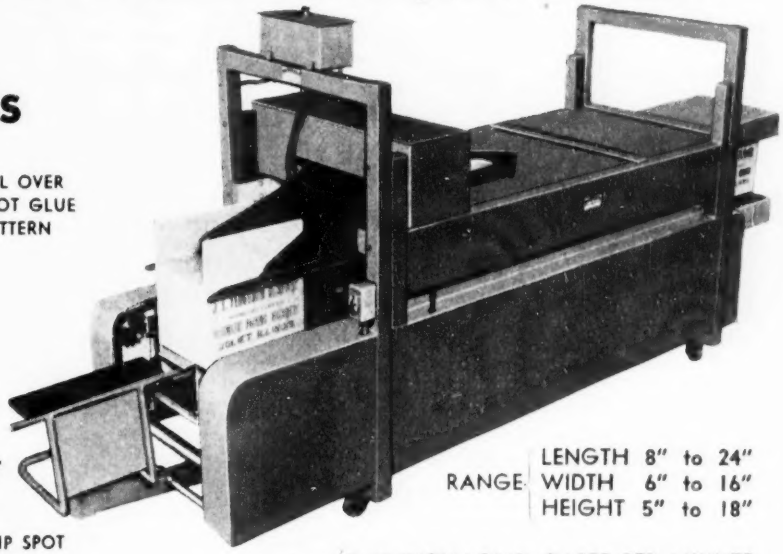


ALL OVER SPOT GLUE PATTERN

SKIP SPOT GLUE PATTERN

STRIP SPOT GLUE PATTERN

SKIMP SPOT GLUE PATTERN



RANGE: LENGTH 8" to 24"
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HEIGHT 5" to 18"

SPEED { 8 12-INCH-LONG CASES PER MINUTE
4 24-INCH-LONG CASES PER MINUTE

The Packomatic Packer-Gluer is intermittent in operation. The operator packs the case on a packing table and moves it slightly forward, where it contacts a starting trip. All other operations are automatic.

Glue applying system is ALL NEW. By applying glue to the outer case flaps in spots at ¾" centers each spot has the advantage of being aerated around its entire circumference, allowing the glue to spread and become absorbed much faster than when it is applied in an all-over design where the roll applying method is used. Spot application of glue makes a faster, tighter adhesion.

The Packomatic Packer-Gluer occupies less than 30 square feet of floor space; has fewer moving parts than any sealing equipment on the market.

Applies glue to inner surface of outer flaps while flaps are in a vertical position

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probably be sought before scheduling a hearing; initiative of Secretary.

Tentative Orders Awaited: 1. Residue tolerances, on fresh fruits and vegetables, new. Expected soon; hearing adjourned Sept. 1950; briefs filed Dec. 1950.

2. Canned pineapple and canned pineapple juice, new, standards of identity, quality, and fill. Expected momentarily; hearing adjourned in Apr. 1952; briefs were then filed in Sept. 1952.

3. Ice cream, new, standard of identity. Not expected soon; hearing adjourned in December; briefs due on Aug. 3.

Final Order Awaited: Frozen fruits, new, standards of identity and fill. Expected momentarily; tentative order published in Oct. 1950; exceptions filed in Jan. 1951.

Standards Completed: None since canned mushrooms amendment (FE Oct., P. 207).

Correction

In the list of equipment of the April issue FE Picture-Flowsheet, "Making Fresh-Pack Pickles," the address of Standard Machine Co. should have been given as Canton, Mo.

'Air Envelope' Care

—*Continued from page 76*

The large coil is to occupy the area of one entire end-wall and will be located on the lading side of the insulated engine-compartment bulkhead but protected by a false bulkhead. This is in air space forming part of the car flue. The coil is specified as 10½ in. deep by 84 in. wide by 75 in. high, with ¾ in. o.d. copper tubing having aluminum fins, spaced 1 in. apart, offering a surface of approximately 1,150 sq. ft.

It is expected that the "air envelope" will reduce frosting to a point where the newly designed cooling coil can accept the frost accumulation of an entire trip without serious detriment to the cooling process, obviating need for defrosting heaters and thus eliminating defrosting-control equipment and its attendant risk of failure.

Trane units will be installed in the cars having this large coil and will use a 30-hp., 2-cylinder, 4 cycle diesel engine driving a direct-coupled 15-kw., 220v. alternator. This unit will supply power for a 10-hp. motor driving a 4-cylinder V-type compressor running at 1,750 rpm. It will also power the air circulating fans.

These first mechanical units for P.F.E. cars have been planned to provide a good comparison of operating performance and a basis for assembling information fundamental to mechanical regfrigeration improvement.

In this endeavor, P.F.E. may be considered to be pioneering. It is known that mechanical units perform well in producing low temperature. But much remains to be learned of their maintenance costs, life in transportation service, and design modifications that might be indicated for attaining the most satisfactory railroad refrigerator.

End (Resume reading on page 77)

Truck Tankers

—*Continued from page 71*

two aluminum tank units, to be similarly insulated and coated. Each of these will provide an increased payload capacity of 6,000 lb.

The trucks are Peterbilts with diesel engines. Both the trailer and the tanks for the truck and trailer are Bealls. Driver's sleeping compartment is fitted directly behind truck cab (see photos).

All of the units conform to the motor vehicle laws in the States of California, Oregon, and Washington, which limit gross vehicle laden weight to 76,000 lb. with maximum axle loads of 18,000 lb. The unladen train weight of the units with steel tanks is 33,350 lb., leaving a balance of 42,650 lb. for the train payload, equivalent to 7,171 gals.

Promoted by Engineer

Specializing in the distribution of bulk food products, Arrow employs a full time engineer for the development of such hauls for interested processors. Planned is application for rights to haul such products anywhere in the U. S. where volume-warranting two-way hauls can be contracted.

In initiating the current runs, transport of the grape juice was started first. It now comprises four loads a week in season on the southbound schedule. Movement of wines northbound was then pioneered to build profitable return loads. A number of wineries in the San Francisco Bay area are now distributing their northbound loads via Arrow.

Another instance to be remarked is the haulage of liquid sugar from the California & Hawaiian Sugar Refining Corp., Crockett, Calif., to the Arden Farms Co., Portland. Also now carried in this manner is vinegar. (C&H's

New SHOPPING CENTER Uses

FRICK Air Conditioning Throughout

The eleven stores in the big new Freedom Shopping Center in Baltimore, built and owned by Henry J. Knott Enterprises, are all kept cool and comfortable with Frick Unit Air Conditioners. Several of these are tied-in with heaters for year-'round use. Installation by the Paul J. Vincent Co., Baltimore Distributors who have put Frick Air Conditioning in over 100 theatres.

Frick Units, like this one in the Beauty Salon, Air Conditi[illegible] all the Shops at Freedom Center.

Frick Refrigerating and Air Conditioning Equipment can solve YOUR cooling problems equally well. Write

DEPENDABLE REFRIGERATION SINCE 1862
FRICK CO.
WAYNESBORO, PENNA. U.S.A.

Also Builders of Power Farming and Sawmill Machinery

own truck carriage of bulk granulated sugar was described in April FE.)

Formerly, shipments of wines from Delano, Calif., went to New Italian Importing Co., by rail in 6,600-gal. tank cars. Since the latter firm has no rail siding, the tank cars had to be spotted six to eight blocks away, and the wine unloaded into barrels and transferred to the company by platform truck.

This required three men working two days of 8 hr. each, or a total of 48 man-hours. At a labor cost of $2.25 per hour, this totaled $108.00. In addition, the trucking of the filled barrels cost $4.50 per hr. or $72.00 for two days, making the grand total for unloading $180.00.

But with use of the Arrow tankers, the wine is pumped directly from truck and trailer at the curb into the company's 12,000-gal. storage tanks in the basement. This requires the services of only one man working 5 hr. or less. At the same labor rate of $2.25 per hr., the tanker unloading cost is only $11.25.

First delivery to New Italian was a drop of 4,806 gal. Figured at the charges just named, this is an unloading rate of approximately ¼c. per gal., as compared with 3c. per gal. from the tank cars—a reduction in cost of 2¾c. per gal. Also time of the job was cut from 2 days to 5 hr. For every such drop of 4,806 gal. the company thus makes $132.16 saving in unloading expense.

The above was not the only saving to credit to the motor tankers. By rail, the wine shipments took from 6 to 12 days; but by motor tankers only 48 hr. Such quicker delivery means New Italian can order more often in smaller quantities and so reduce value of its inventory by $7,500.

End (Resume reading on page 72)

Continuous Proportioning

—Continued from page 76

speed control so that the entire output can be controlled from a remote source. However, an alternate method of operation is included. The third concentrator has a level control with a pneumatic output. This output positions a potentiometer, which in turn will automatically set drive speed of the first (or control) pump, thereby using the output flow as a governor on the process rate.

A mill turning out self-rising flours has converted to a continuous operation. From storage, grain is transferred to two mill tanks and then to additional cleaning and tempering equipment. Flour is then conveyed to sifters. Four gravimetric feeders meter flour, soda, phosphate, and salt to a conveyor belt. Feeders operate from motors electrically interlocked so that they will keep in step. Then from the mixing unit, the flour goes to hoppers feeding the packers. The new installation enables this company to produce and pack in 8 hr. a previous 24 hr. output.

In contemplating the fully or partially continuous operation it might be well to remember that a number of manufacturers have been active in this field for many years. They offer a complete package, and thus eliminate many of the headaches associated with finding equipment and tying it into an integrated plan. They have experience in the various applications and can show where savings can be made, where specifications can be modified, and where equipment, not yet familiar to you, can be added or substituted in the flow plan to provide a smooth, efficient plant.

The above feature article was based on a talk "Continuous Proportioning, Blending and Mixing Equipment," given before the New York Section, Institute of Food Technologists.

End (Resume reading on page 76)

Recent Inventions

PRODUCTS

Vitamin-Containing Chocolate Food Comprising two Contacting Parts of Mineral Supplements and Vitamins With Interspersed Milk Protein Preventing Mixing of Incompatible Ingredients—*F. T. Kimball, South Norwalk, Conn., to Orizar Products, Inc., New York. No. 2,634,210. April 7, 1953.*

Ground Meat Product Incorporating Water Soluble Hydrolysate of Starch With D.E. of 24-55—*S. L. Komarik, to Griffith Laboratories, Inc., Chicago. No. 2,634,211. April 7, 1953.*

Conditioner for Ground Meat Products Comprising Homogeneous Pulverized Mixture of Starch Hydrolysate, Oleaginous Material and Sodium Chloride—*S. L. Komarik, to Griffith Laboratories, Inc., Chicago. No. 2,634,212. April 7, 1953.*

Stabilized Shortening Including Non-Foaming Fatty Glyceride at Less Than 0.5 ppm and Methyl Silicone in Amounts More Than 0.3 ppm—*J. B. Martin, Woodlawn, Ohio, to The Proctor & Gamble Co., Cincinnati. No. 2 634,213. April 7, 1953.*

Product Comprising Comminuted Meat, Aqueous Liquid and Fraction of Percent Dihydroxyphospholipid—*E. F. Glabe, to Food Technology, Inc., Chicago. No. 2,635,963. April 21, 1953.*

PROCESSES

Preparing Dressed Fowl By Slitting Skin, Removing Legs, Wings, Intergrated Skin, Enclosing Deboned Flesh—*M. Snyder, New York. No. 2,633,601. April 7, 1953.*

Preserving Tuna Fish Loins by Dressing With Brine, Cooking to Coagulate Proteins, Spraying With Cold Water, Cutting, Packing Into Hermetically Sealed Cans—*C. B. Stevenson, Wilmington, and J. A. Hodges, Long Beach, Calif. to Harold D. Pauley, Los Angeles. No. 2,635,050. April 14, 1953.*

Removing Alkali Elements From Sugar Solutions by Passage Through Anion-Exchange Resin Containing Quaternary Ammonium Hydroxide Groups, Then Through Cation-Exchange Resin—*C. H. McBurney, to Rohm & Haas Co., Philadelphia, Pa. No. 2,635,061. April 14, 1953.*

Synthetic Non-Crystalline Chewing Gum Base Resin Consisting of Reaction Product of Dodecene, Maleic Acid Anhydride, and Tall Oil—*E. J. Hewitt, Dobbs Ferry, and M. Berdick, New York, to American Chickle Co., Long Island City, N. Y. No. 2,635,964. April 21, 1953.*

Space Paste Composition With Fineness of About 100 Microns Ground in Liquid to Produce Tacky Composition—*H. R. Ansel, to Wm. J. Stange Co., Chicago. No. 2,636,824. April 28, 1953.*

EQUIPMENT

Pretzel Twisting Machine With Articulate Dough Strip Receiving Flanges and Cam-Actuated Twister Yoke—*H. S. Gipe to Quinlan Pretzel Co., Reading, Pa. No. 2,628,577. Feb. 17, 1953.*

Fruit Handling and Conveying Mechanism With Means for Transferring Fruit From and Into Individual Receptacles Through Gravital Fall and 90 deg. Turn—*G. Ashlock, Jr., Oakland, Calif. No. 2,630,205. March 3, 1953.*

Bottle Timing and Indexing Mechanism Employing Continuously Rotating Timing Screw and Stop Means for Improperly Positioned Bottles—*J. S. Bozek, Franklin Park, Ill. to Standard Packaging Corp., Chicago. No. 2,630,904. March 10, 1953.*

Processing Apparatus for Food in Containers Consisting of Enclosing Chamber With Internal Inclined and Tiltable Track-Carrying Structures—*E. R. Anderson, Campbell, Calif. No. 2,630,908. March 10, 1953.*

Flow Diversion Valve Employing Two Hollow Sanitary Tees, Upper Tee Having Inlet and Divert Port Served by Vertically Thrust Valve Stem and Plug—*A. W. Griswold to Taylor Instrument Cos., Rochester, N. Y. No. 2,631,001. March 10, 1953.*

Automatic Apparatus for Drying Elongated Dough Products Employing Central Forced Air Circulation and Sliding Carriers—*L. Bettini, Rome, Italy. No. 2,631,383. Mar. 17, 1953.*

Machine for Freezing Packaged Products Employing Top and Bottom Horizontal Charging and Discharging System—*I. H. Polk, San Jose, Calif. No. 2,631,440. Mar. 17, 1953.*

Device for Curling Sheet of Dough on Endless Carrier Belt—*H. C. Rhodes, Portland, Ore. to Read Standard Corp. No. 2,631,549, 50. Mar. 17, 1953.*

Continuous Conveyor Belt Produce Washing Apparatus Employing Rotating Agitator Paddles—*W. E. Saxe, San Gabriel, Calif. to The Conveyor Co., Los Angeles. No. 2,631,596. Mar. 17, 1953.*

WHEN YOUR BUSINESS IS IN *Good Taste*

. . . why not let Cherry-Burrell help you keep it that way? With Cherry-Burrell sanitary pumps, tubing, valves and fittings handling your product, there's *no chance* to pick up undesirable flavors . . . *all the chance* in the world to protect your product's purity; your customers; your business.

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- Available in portable models
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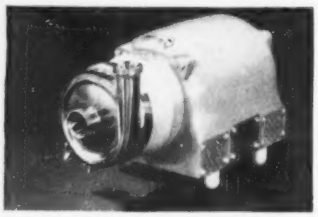

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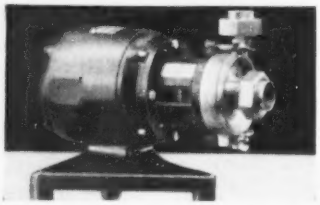

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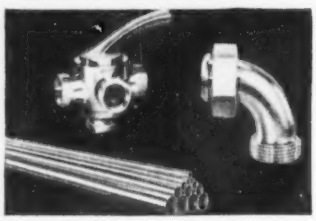

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Fruit Cutting and Juice Extracting Machine Employing Complementary Cupping Means With Interposed Cutting Knife, and Rotating Juicer Head With Plurality of Reamers—*L. A. Wells, Long Beach, Calif. to Brown Citrus Machinery Corp., Whittier, Calif.* No. 2,631,625. Mar. 17, 1953.

Apparatus for Peeling Fruits and Vegetables Employing Rotating Steam-Chambered Drum—*O. P. Pierson, Caribou, Maine.* No. 2,631,627. Mar. 17, 1953.

Apparatus for Continuously Peeling Fruit or Vegetable Products Employing Helical Conveyor in Rotating Cylinder With Impinging Spray Nozzles and Means for Supplying Superheated Steam to Loosen Skin—*W. McK. Martin, San Mateo, Calif. to James Dole Engineering Co., Redwood City, Calif.* No. 2,631,628. Mar. 17, 1953.

Apparatus for Continuously Concentrating and Separating Crystals From Solution Comprising Multiple Effect Evaporator With Built-In Separating Chambers—*A. W. Eckstrom, Buffalo, N. Y. to Blaw Knox Co., Pittsburgh, Pa.* No. 2,631,926. Mar. 17, 1953.

Device for Detaching Heads of Poultry Suspended From Conveyor Consisting of Neck Lodging Slot and Cutting Knife—*E. L. Fortner, and W. S. Stevenson, Gainesville, Ga. to Swift & Co., Chicago.* No. 2,632,200. Mar. 24, 1953.

Poultry Shackle for Holding Carcasses by Feet in Vertical Position—*D. B. Van Dolah to Swift & Co., Chicago.* No. 2,632,201. Mar. 24, 1953.

Vertical Pressure Plate Food Freezing Machine With Means for Applying and Wiping Anti-Icing Fluid to Heat Exchange Plates—*I. H. Polk, San Jose, Calif.* No. 2,632,312. Mar. 24, 1953.

Can Cooker Consisting of Enclosure With Thermal-Treating Fluid and Basket-Bearing Carrier Chains—*P. Carvallo, Barcelona, Spain.* No. 2,632,378. Mar. 24, 1953.

Apparatus for Removing Loose Flour From Surface of Dough Moving on Conveyor—*F. A. Anetsberger, Chicago to Anetsberger Brothers, Inc., Northbrook, Ill.* No. 2,632,410. Mar. 24, 1953.

Defrosting Tank for Confection Molds—*A. Friedman to Joe Lowe Corp., New York.* No. 2,632,453. Mar. 24, 1953.

Continuous Egg Separating Apparatus Employing Series of Belt-borne Cup and Saucer Carriers for Yolk and White Respectively and Integrated Pair of Suction Extracting Nozzles to Empty Vessels—*D. Freiberg, Milwaukee, Wis.* No. 2,632,490. Mar. 24, 1953.

Egg Washing and Wiping Machine Employing Parallel Multiple-Ribbed Rollers of Curved Shape to Shift Eggs Back and Forth—*A. Markusen, Petaluma, and J. S. Bahnsen, Penngrove, Calif.* No. 2,632,901. Mar. 31, 1953.

Flour Duster for Dough-Working Machine Employing Reciprocating Perforated Plate and Frame—*H. C. Rhodes, Portland, Ore. to Read Standard Corp.* No. 2,633,242. Mar. 31, 1953.

Automatic Oven Unloader Employing Rotating Dumping Structure—*H. E. Temple, Los Angeles, and G. E. Tench, South Pasadena, Calif. to Baker Perkins Inc., New York.* No. 2,633,258. Mar. 31, 1953.

Continuous Sugar Crystallizer Employing Plurality of Moving Individual Heat Transfer Devices—*E. W. Kopke, New York.* No. 2,633,435. Mar. 31, 1953.

Apparatus for Treating Potato Chips During Oil Cooking Comprising Assembly of Rotary Propellor Shafts Vertically Adjusted in Cooking Vat—*E. V. Wise, Sr., to Wise Potato Chip Co., Berwick, Pa.* No. 2,633,793. April 7, 1953.

Pan Greasing Apparatus Employing Electrically Operated Grease Sprayer Actuated by Pan Movement—*E. Koerber, Chicago.* No. 2,633,820-21. April 7, 1953.

Continuous Hop Drying Apparatus Employing High Velocity Hot Gas in Enclosed Conveyor Tunnel—*V. A. Bloxham, Berkeley, Calif.* No. 2,634,117. April 7, 1953.

PACKAGING

Vacuum Sealing Machine for Packages Utilizing Thermoplastic Open-Mouthed Bags—*M. Moses, Beverly Hills, and R. L. Peach, Los Angeles, to Rancho Granada Co., Inc., Los Angeles, Calif.* No. 2,620,955. March 10, 1953.

Soft Plastic Food Package Employing Reversible Thin Flexible Product-Encasing Film Which Can Be Separated When Outer Rigid Container is Pulled From Product—*L. Peters, Evanston, Ill.* No. 2,631,939. Mar. 17, 1953.

Bag Baling Mechanism—*H. Frank Davies, Loveland, Colo. to The Great Western Sugar Co., Denver.* No. 2,633,280. Mar. 31, 1953.

Can Unscrambling Device Employing Horizontal Conveying Troughs—*J. and G. B. Albertoli, San Francisco, Calif.* No. 2,633,971. April 7, 1953.

Want more information on any of these recent patents? If so, you may obtain detailed printed copies by writing direct to the U. S. Patent Office, Washington, D. C., giving serial numbers of those you want and enclosing 25¢ for each copy.

Men & Companies

Frederick H. Leonhardt (left), former president of Fritzsche Brothers, Inc., has assumed company's newly created post of chairman of the board. He is succeeded by **John H. Montgomery** (right), former first vice-president of the essential oil and chemical firm.

Industry

A. P. Stewart & Assoc., newly formed food processing consulting firm, has opened offices in San Francisco.

Armour and Company has leased a 100,000 sq. ft. building at Morgan Hill, Calif., to process poultry.

Barnard Processing Corp. will enlarge Sunset Distillery, Alviso, Calif., for conversion of pear waste into alcohol and feed stock.

Beatrice Foods Co. and **Creameries of America, Inc.,** have approved a merger plan, the resulting company to continue processing dairy products under the Beatrice name.

Borden Co. plans to build a new combination cheese warehouse and prepared biscuit plant in Dallas.

Lawrence E. Ernst, director of quality control laboratories at Froedtert Grain & Malting Co., was elected president of American Assn. of Brewing Chemists at the annual meeting in Cincinnati.

Canada Dry has expanded its franchise department in a move to broaden services to Canada Dry bottlers.

Christie, Brown & Co., Canadian baker, is constructing a $2,000,000 addition to its Winnipeg bakery.

Cudahy Packing Co.'s meat plant in Los Angeles has been sold, but company retains the margarine factory on site.

Dr. Pepper Co. has opened a modern $300,000 bottling plant in St. Louis.

Fairmont Foods Co. announces election of John F. Merriam and Eugene Holland as directors.

Foremost Dairies, Inc., announces acquisition of **Banner Dairies** and will operate it as a subsidiary.

General Foods Corp. reports formal agreement by which **Perkins Product Co.** becomes a wholly owned subsidiary.

Green Giant Co. had promoted Edward B. Cosgrove to board chairman and William F. Dietrich to president.

Lucerne Milk Co. has opened a $500,000 plant at Phoenix, Ariz.

Minute Maid Corp. is completing negotiations for purchase of $2,400,000 worth of groves and other property from former Tripleie Development Co., Polk County, Fla.

Municipality of Ankara, Turkey, will begin operation of a $1,785,000 meat packing plant in 1954.

National Biscuit Co. has opened a $20,000,000 Chicago bakery.

OLD STAGG
SEAGRAM'S V. O.
IMPERIAL
OLD SUNNYBROOK
CANADIAN CLUB
PAUL JONES
SCHENLEY RESERVE
CREAM OF KENTUCKY
HILL & HILL (Straight)
CORBY'S RESERVE
EARLY TIMES
CALVERT RESERVE
PARK & TILFORD RESERVE
HUNTER
FOUR ROSES
GOOD OLD GUCKENHEIMER
CARSTAIRS WHITE SEAL
FLEISCHMANN'S PFD.
HILL & HILL (Blend)
PM DELUXE
SEAGRAM'S SEVEN CROWN
OLD CHARTER
OLD SUNNYBROOK
ECHO SPRINGS
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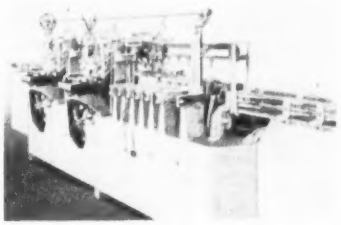

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To give you big, long-term savings in conveying bulk flowable materials, Hapman offers many exclusive conveyor engineering features.

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WRITE FOR NEW BULLETIN FE-753

HAPMAN
Conveyors handle:
METAL Chips, Sludges, Carborundum Dust — Wet or Dry CHEMICALS: Powdered, Granular, Abrasive, Corrosive—FOODS: Wet Spent Grains, Starch, Flour, Malt—Powered Coal, Ashes, Filter Cake, etc.

Below: Illustration from new bulletin shows conveyor discharging metal chips into tote box.

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN

Robert R. Schwain is newly elected president of American Assn. of Cereal Chemists. He is in charge of bakery research department of Proctor & Gamble Co.'s chemical division.

Purity Bakeries Corp. will merge with **American Bakeries Co.**

Rich Coffee Co. of Dallas, has opened a plant to pack coffee in individual bags under a franchise.

Snow Crop Marketers Div. has changed its title to **Snow Crop Div. of Clinton Foods.**

Terry Dairy Products Co., Little Rock, Ark., has opened a new $1,000,000 dairy plant.

Personnel

Dr. Harold J. Bassett, is new technical director of dairy and special products division of E. F. Drew & Co., Boonton, N. J.

Paul J. Bourchier has been appointed to newly created position of vice-president in charge of production of Avoset Co., San Francisco processor of sterilized milk and cream.

C. S. Brinsfield is 1953-54 president of Central Atlantic States Assn. of Food & Drug Officials.

T. H. Broekner is a newly elected director of National Independent Meat Packers Assn.

Rear Admiral Richard E. Byrd has been named vice-president of Arnold Bakers, Inc.'s frozen products division.

Robert C. Crampton, vice-president and general sales manager of A. Schilling & Co., Division of McCormick & Co., is new member of parent company's board of directors.

Dr. Domenic DeFelice is new research manager for associated products division of General Foods Corp.

Frank W. Elzey has been elected president of Becker Pretzel Bakeries, Inc., of Baltimore.

Peter Folger has been elected president of Pacific Coast Coffee Assn.

Forrest Grayson is new president of Detroit Creamery Co. and Ebling Creamery Co., both subsidiaries of National Dairy Products Corp.

Dr. Norman Jolliffe has been appointed to American Institute of Baking's scientific advisory committee.

W. W. Jung will take charge of Pillsbury Mill's new bakery mix lab in Los Angeles.

T. O. Kluge has been re-elected president of Dried Fruit Assn. of Calif.

Edwin S. Knauss has been elected president of Eastern Meat Packers Assn.

E. C. Lewis, manager of Armour and Company's margarine department, has been elected a director of National Assn. of Margarine Manufacturers.

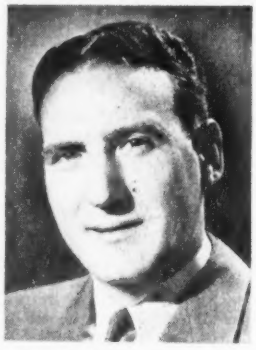
William J. Mahan has been named assistant to vice-president and director of research of Kraft Foods Co.

Manfred Massiello is new director of engineering for Hanscom Baking Corp. and Gottfried Baking Co., Inc.

Leon A. Miller has been appointed president and general manager of General Foods Ltd. of Toronto.

William C. Mitchell has been elected vice president in charge of frozen foods division of Libby, McNeill & Libby.

Donald M. Mounce, manager of Campbell Soup Co.'s Sacramento plant, has been promoted to general production manager of all company plants.



L. Collins has been named vice-president of Orange-Crush Co.

H. Earle Muzzy is newly elected president of Quaker Oats Co.

W. S. Obernshain, Jr., has been appointed a director of Southern Dairies, Inc.

John J. Quinlan, vice-president of Allied Mills, Inc.'s soybean division, has been elected a director.

Dr. Andrew C. Rice has been named technical director of Seneca Grape Juice Corp.

Lyle C. Roll has been named to newly created post of executive vice-president of Kellogg Co.

Fred Schumm will manage Ungerer & Co.'s flavor department.

Dr. Harold W. Schultz has been appointed head of Oregon State College's food technology department.

J. Spencer Smith has been elected board chairman of Newark Packing Co., Inc.

Edwin R. Smith has been re-elected president of Eastern Milk Producers Cooperative Assn.

William O. Wallburg, assistant general manager of W. F. Schrafft & Sons Corp., is new president of New England Manufacturing Confectioners Assn.

John A. Weiss is new vice-president in charge of production at Maier Brewing Co., Los Angeles.

Associated Industries

Air-Conditioning & Refrigeration Institute has elected L. C. McKesson president.

Alvey Conveyor Manufacturing Co. has been awarded National Advertising Agency's Award of Merit for excellence of its product advertising (which appeared in FOOD ENGINEERING) in non-merchandising business publications.

Anchor Cap & Closure Corp. of Canada, Ltd., an Anchor Hocking subsidiary, has elected W. F. Wilson as president.

Continental Can Co. has purchased flexible packaging business of **Shellmar Products Corp.** of Mt. Vernon, Ohio) and also plans construction of a Winter Garden, Fla., plant.

Florasynth Laboratories, Inc., will occupy Borden Co.'s building and grounds in New York as part of its Eastern plant expansion.

Bernard E. Proctor, head of Massachusetts Institute of Technology's food technology department, has been appointed to the board of National Phoenix Industries, Inc. He is former director of food and packaging research for Office of Quartermaster General.

Food Machinery & Chemical Co. has elected Jan Costermeyer a director.

General Cap & Closure, a division of Jaques Manufacturing Co., and the **Aridor** subsidiary of Ball Brothers Co., Inc., will merge.

Heyden Chemical Corp. has elected Arthur R. Broadman as vice-president in charge of engineering and purchasing.

Milprint, Inc.'s meat and poultry packaging division will be headed by Chester W. Dold.

Union Carbide & Carbon Corp.'s Bakelite Co. has named George C. Miller as its new president.

Deaths

Edward August Bromm, 67, president of L. Bromm Bakery Co., Richmond, Va.—May 22.

Peter Droge, 80, retired California fruit packer and vintner.—April 29.

Lloyd P. DuMond, 68, former executive vice-president and manager of W. R. Roach Co., pea canners.—May 12.

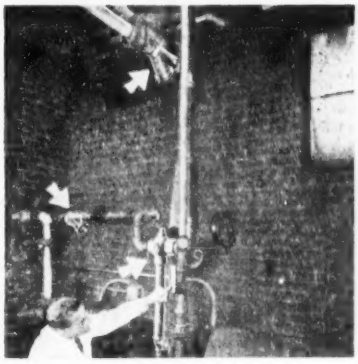
Harry Epstein, founder and president of Grayslake Gelatin Co.—April 5.

John A. McFeeters, 80, founder of McFeeters Creamery Co., Ltd., Toronto, Canada.—April 9.

Louis E. Metzger, director and secretary of Bowman Dairy.—May 25.

Paul J. Rich, 72, board chairman of Rich Ice Cream Co., Inc.—May 22.

Meat Washing without Wasting Fat



Cross Bros., Meat Packers of Philadelphia, Pa., report that the copious volumes of water used to wash down carcasses after the hide is removed, must be held at just the right temperature.

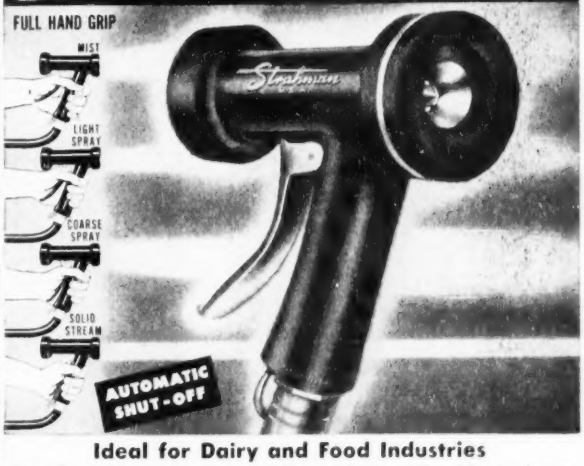
If too hot, some fat will go to waste; if too cold, some of the waste will adhere, no matter how much water is sprayed.

For best results, they temper their wash water to 80°F. with the Sarco Water Blender type MB-DS shown in the above picture. It mixes cold water with hot at 180°F. from their storage water heater.

Mr. G. F. Werlin, Plant Superintendent, is well pleased with the simplicity and accuracy of the Sarco blender and is now installing a duplicate unit.

For full information write for Bulletin 800-6 to **Sarco Company, Inc.** Empire State Bldg., New York 1, N. Y. There is no obligation. Advt. 612

Strahman AUTOMATIC WATER-SAVER SPRAY NOZZLE



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RENEWABLE RUBBER COVER. The sturdy cover protects the nozzle and your equipment against knocks and dents. When the cover becomes worn, replace it with a new one.

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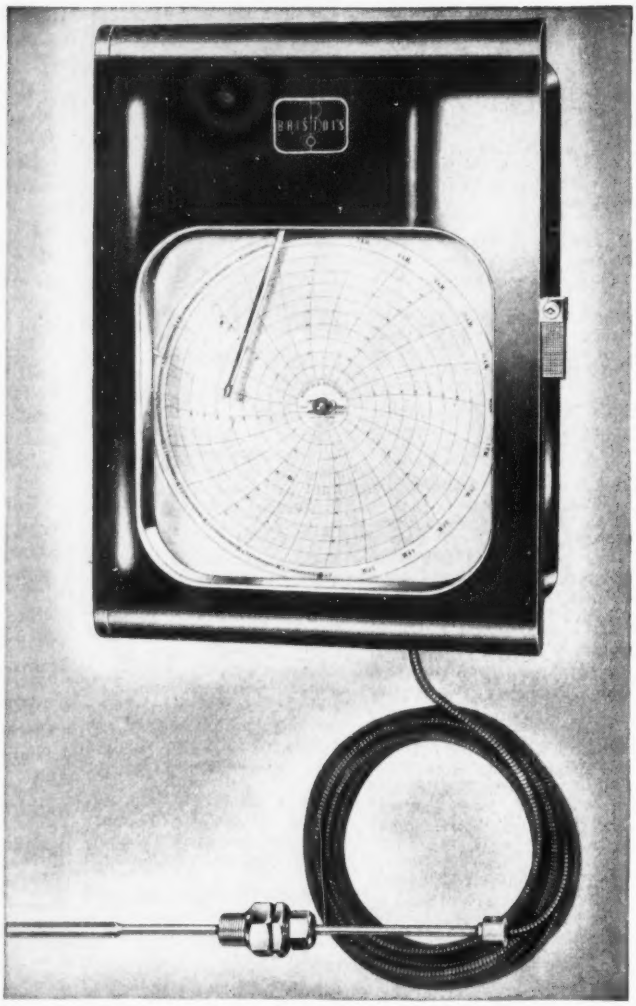

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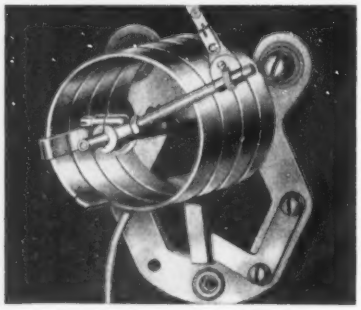

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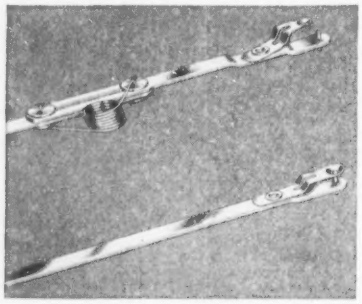

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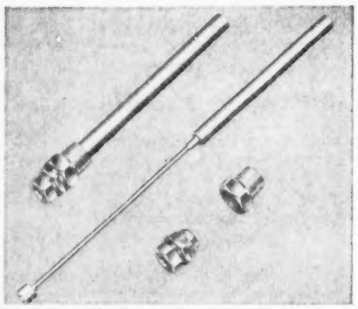

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Just Off the Press

New Catalogs and Bulletins
from manufacturers of equipment and supplies
—Free For The Asking—

Food Plant Equipment

Cooling Towers

Bulletin CF 53-1 features dimensions and capacity data of centrifugal fan cooling towers.—*E. D. Goodfellow Co., Inc., 496 Bodley Ave., Memphis.*

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Bronze Globe Valves

Circular 582 covers design and construction features of 125-pound pressure globe, and check bronze valves.—*Lunkenheimer Co., Box 360U, Cincinnati 14.*

Circle 205B on Reader Service Card

Quick Freeze Plates

Catalog AE presents engineering data and specifications on line of quick freeze plates, storage room plates and soda fountain plates. 12 pages.—*Dole Refrigerating Co., 5910 N. Pulaski Road, Chicago 30.*

Circle 205C on Reader Service Card

Scale Feed

Completely automatic packaging with net weight scale feed is reported in bulletin. 4 pages.—*Transparent-Wrap Machine Corp., Route 17 & Henry Streets, Hasbrouck Heights, N. J.*

Circle 205D on Reader Service Card

Can Manufacturer

Line of machines for making cans and containers are dealt with in Catalog 36A. 30 pages.—*E. W. Bliss Co., 1375 Raff Road S.W., Canton, O.*

Circle 205E on Reader Service Card

Motor Applications

Catalog 200 deals with applications of all types of motors, adding technical data and selection charts. 26 pages.—*Louis Allis Co., Milwaukee 7.*

Circle 205F on Reader Service Card

Air-Operated Dispenser

Feeding oil and other fluids by air pressure through air-operated dispensers is treated in Bulletin 82-11.—*Oil-Rite Corp., Manitowoc, Wis.*

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Pneumatic Receivers

Specifications and photos of pneumatic receivers are furnished in leaflet.—*Minneapolis-Honeywell Regulator Co., Wayne & Windrim Aves., Philadelphia 44.*

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Hulling Equipment

Bulletin 0-4 illustrates hulling and separation equipment for oil-bearing seeds and nuts. 4 pages.—*Bauer Bros. Co., Springfield, O.*

Circle 205I on Reader Service Card

Safety Valves

Bulletin 194 covers advantages of line of safety valves with stainless steel seat and moving parts. 4 pages.—*Frick Co., Waynesboro, Pa.*

Circle 205J on Reader Service Card

Centrifugal Pumps

Centrifugal pumps featuring capacities up to 1,000 GPM and heads to 400 feet are subject of Bulletin WQ-214. 4 pages.—*Warren Steam Pump Co., Inc., Warren, Mass.*

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Plate Filter

Controlled suspension plate filter, featuring spring-type clamping plates, is dealt with in booklet. 4 pages.—*W. M. Sprinkman Corp., 4022 N. Port Washington Ave., Milwaukee 12.*

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Bag Packer

Leaflet deals with advantages of automatic bag packer. 4 pages.—*E. D. Coddington Mfg. Co., 5024 N. 37th St., Milwaukee 9.*

Circle 205M on Reader Service Card

Motion Control

Three booklets offer detailed information on electric motion control, through electric clutch and clutch-coupling.—*Warner Electric Brake & Clutch Co., Beloit, Wis.*

Circle 205N on Reader Service Card

Boiler Baffles

Application of streamlined baffles to all types of boilers is theme of booklet. 4 pages.—*Engineer Co., 75 West St., New York 6.*

Circle 205O on Reader Service Card

Demineralizers

Data sheet has new model demineralizer as its subject.—*Penfield Mfg. Co., Inc., 19 High School Ave., Meriden, Conn.*

Circle 205P on Reader Service Card

Power Transmission

Bulletin 10,000 lists products, services and facilities of power transmission equipment manufacturer. 12 pages.—*Falk Corp., 3001 W. Canal St., Milwaukee 8.*

Circle 205Q on Reader Service Card

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ject of Bulletin SE-5. 6 pages.—*Sier-Bath Gear & Pump Co., Inc., 9252 Hudson Blvd., North Bergen, N. J.*

Circle 207A on Reader Service Card

Automatic Boilers

Oil or gas fired boilers in sizes of from 10 to 500 hp. are dealt with in catalog. 4 pages.—*Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.*

Circle 207B on Reader Service Card

Industrial Heaters

Photos and diagrams of line of industrial heaters requiring minimum floor space are included in bulletin. 8 pages.—*Thermobloc Div., Prat-Daniel Corp., South Norwalk, Conn.*

Circle 207C on Reader Service Card

Water Softeners

Bulletin WX-108 explains advantages of hydrogen cycle of zeolite water softening. 12 pages.—*Graver Water Conditioning Co., 216 W. 14th St., New York 11.*

Circle 207D on Reader Service Card

Rotary Pressure Joint

New rotary pressure joint featuring low torque and self-alignment is discussed in leaflet.—*Anco Inc., 1 Baker St., Providence 5, R. I.*

Circle 207E on Reader Service Card

Immersion Heaters

Electric immersion heater catalog features application data for calculating power requirements for heating process tanks.—*Cleveland Process Co., 7016 Euclid Ave., Cleveland 3.*

Circle 207F on Reader Service Card

Lubricated Plug Valves

New line of steel and semi-steel lubricated plug valves are featured in booklet illustrated with diagrams and tables. 30 pages.—*Ohio Injector Co., Wadsworth, Ill.*

Circle 207G on Reader Service Card

Motor-Generators

Bulletin 30-200 describes motor-generators ranging from ¾ to 1500 kw. 6 pages.—*Electric Products Co., 1725 Clarkstone Road, Cleveland 12.*

Circle 207H on Reader Service Card

Riveted Roller Chains

Bulletin 52-2 covers details of multiple width, riveted roller chain, including data on manufacture and applications. 24 pages.—*Chain Belt Co., Milwaukee 1.*

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Electronic Drive

Improved electronic adjustable-speed drive of from ¾ to 3 hp. is featured in Bulletin D-2102. 12 pages.—*Reliance Electric & Engineering Co., 1111 Ivanhoe Road, Cleveland 10.*

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Foamless Filler

Semi-automatic foamless filler for liquids and semi-liquids is described in leaflet.—*Shaner Equipment Co., Box 390, La Grange, Ill.*

Circle 207K on Reader Service Card

Roller Gear Drives

Specifications, diagrams and photos of roller gear drives are offered in Bulletin 101.—*Ferguson Machine & Tool Co., Inc., 471 Paul Ave., Ferguson Sta., St. Louis 21.*

Circle 207L on Reader Service Card

Rotary Vacuum Filler

Six basic models, with 14 adaptations of rotary vacuum filler, are described in bulletin. 16 pages.—*U. S. Bottlers Machinery Co., 4015 N. Rockwell St., Chicago 18.*

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Bottle Washer

Bulletin BW52300 describes two-quart milk bottle washer handling 40 to 100 bottles per min. 4 pages.—*Heil Co., Milwaukee.*

Circle 207N on Reader Service Card

Automatic Packagers

Line of automatic packaging machines featuring product visibility are discussed in leaflets.—*General Machinery Corp., Sheboygen, Mich.*

Circle 207O on Reader Service Card

Impact Pulverizer

Centrifugal air attrition impact pulverizer and classifier contained in a single unit is explained in booklet.—*Schutz O'Neill Co., 311 Portland Ave., Minneapolis 15.*

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Control Equipment

Humidity Indicators

Leaflet and sample show use of humidity-indicating cards as aids to processors.—*Andrew Technical Service, 3805 N. Clark St., Chicago 13.*

Circle 207Q on Reader Service Card

Heater Controls

Controls for water heaters are described in illustrated brochure.—*General Controls Co., 801 Allen Ave., Glendale 1, Calif.*

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Pressure Transmitters

Designed to operate controlling and recording system, pressure transmitter with voltage ranging from 0.000 to 0.500 volts 60 cycle AC is covered in leaflet. 4 pages.—*Swartout Co., 18511 Euclid Ave., Cleveland 12.*

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Dual-Channel Oscilloscope

Leaflet contains details on advantages of direct-coupling, wide band width, and delayed sweep control incorporated into a dual-

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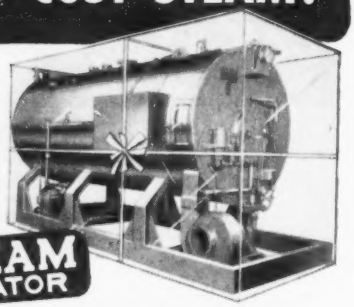

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channel oscilloscope.—*Electronic Tube Corp., 1200 E. Mermaid Lane, Philadelphia 18.*

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Data Recorder

Brochure details advantages of data recorder providing visual or printed records of physical quantity converted into voltage. 4 pages.—*Streeter-Amet Co., 4101 Ravenswood Ave., Chicago 13.*

Circle 208B on Reader Service Card

Weight Recorder

Mechanical weight recorder, built into a tape-drive dial head, is subject of brochure.—*Howe Scale Co., Rutland, Vt.*

Circle 208C on Reader Service Card

Automatic Titration

Bulletin 307 reports on performance of high speed electronic device which titrates for moisture automatically. 4 pages.—*Beckman Instruments, Inc., South Pasadena 1, Calif.*

Circle 208D on Reader Service Card

Purge Rotameters

Use of purge rotameters where small, inexpensive flow meters are needed to indicate and manually control small flows is discussed in leaflet.—*Schutte & Koerting Co., 1254 N. 12th St., Philadelphia 22.*

Circle 208E on Reader Service Card

Liquid Level Gages

Bulletin covers dimensions and operation of liquid level gages. 4 pages.—*Jerguson Gage & Valve Co., 87 Fellsway, Somerville 45, Mass.*

Circle 208F on Reader Service Card

Laboratory Appliances

Holders, clamps, supports, and other lab appliances are listed in illustrated catalog. 24 pages.—*Fisher Scientific, 717 Forbes, Pittsburgh 19.*

Circle 208G on Reader Service Card

Gyrating Shaker

Leaflet deals with features of Gyrotory shaker. 4 pages.—*New Brunswick Scientific Co., 10 Hiram St., New Brunswick, N. J.*

Circle 208H on Reader Service Card

Reflection Meter

Bulletin 605 covers photoelectric reflection meter and recently developed accessories. 8 pages.—*Photovolt Corp., 95 Madison Ave., New York 16.*

Circle 208I on Reader Service Card

High-Powered Magnets

Tramp iron protection through high-powered suspension magnets is subject of Catalog 752. 8 pages.—*Memco Magnetic Engineering & Mfg. Co., Clifton, N. J.*

Circle 208J on Reader Service Card

Materials Handling

Bulk Milk Conveying

Bulk milk movement booklet contains field reports, bacteria count studies, compressor and tank size data, and cooling information. 20 pages.—*Mojonnier Bros. Co., 4601 W. Ohio St., Chicago 44.*

Circle 208K on Reader Service Card

Conveyor Carriers

Belt conveyor carriers are illustrated and discussed in Bulletin 453. 4 pages.—*Stephens-Adamson Mfg. Co., 274 Ridgeway Ave., Aurora, Ill.*

Circle 208L on Reader Service Card

Magnesium Ramps

Use of magnesium ramps for car and truck loading operations is detailed in leaflets.—*Penco Engineering Co., 25 California St., San Francisco 11.*

Circle 208M on Reader Service Card

Truck Refrigeration

Manual on truck refrigeration contains colorful diagrams and charts. 6 pages.—*Kold-Hold Mfg. Co., Lansing 4, Mich.*

Circle 208N on Reader Service Card

Bulk Shipment

Bulk material handling through use of pressed steel cars is discussed in colorful booklets.—*Pressed Steel Car Co., Inc., 179 N. Michigan Ave., Chicago.*

Circle 208O on Reader Service Card

Conveyor Curves

Catalog deals with steel roller conveyor curve. 4 pages.—*Erko, 12032-34 S. Emerald Ave., Chicago 28.*

Circle 208P on Reader Service Card

Conveyor Equipment

Screw conveyors, elevator buckets, and allied equipment for bulk material handling are subject of Catalog 749.54 pages.—*Screw-Conveyor Corp., 700 Hoffman St., Hammond, Ind.*

Circle 208Q on Reader Service Card

Dairy Containers

Line of dairy containers ranging from milk dispenser cans to 400 gal. tanks is dealt with in pamphlet. — *Creamery Package Mfg. Co., 1243 W. Washington Blvd., Chicago 7.*

Circle 208R on Reader Service Card

Fork Lift Truck

Sit-down, center control type tilting fork lift truck with 4000 lb. capacity is explained in Bulletin 430. 6 pages.—*Mercury Mfg. Co., 4044 S. Halsted St., Chicago 9.*

Circle 208S on Reader Service Card

Trailer Tanks

Bulletin 735-B treats with truck and trailer tanks for transportation of milk, cream, and edible oils. 6 pages.—*Stainless & Steel Prod-*

ucts Co., 10001 Berry Ave., St. Paul, Minn.

Circle 209A on Reader Service Card

Steep-Grade Conveyor

Catalog describes conveyor belt capable of moving packages and cartons up and down grades as steep as 55 deg.—*B. F. Goodrich Co., Akron, O.*

Circle 209B on Reader Service Card

Lift Truck Drive

Power steering, diesel drive designed for lift trucks is featured in folder. 8 pages.—*Towmotor Corp., 1226 E. 152nd St., Cleveland 10.*

Circle 209C on Reader Service Card

Power Belt Conveyor

Illustrated folder shows applications and features of portable, medium duty power belt conveyor. 4 pages.—*Rapids-Standard Co., Inc., Grand Rapids 2, Mich.*

Circle 209D on Reader Service Card

Oscillating Conveyors

Positive action oscillating conveyors for conveying, feeding, cooling, and screening loose bulk materials are dealt with in Book 2444. 24 pages.—*Link-Belt Co., 307 North Michigan Ave., Chicago 1.*

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For your convenience, too, all items in this department are listed and keyed in the Reader Service Section.

Plant Supplies

Polyethylene Tubing

Extruded polyethylene tubing and sheeting specifications are listed in catalog. 16 pages.—*Chester Packaging Products Corp., 284 Nepperhan Ave., Yonkers 2, N. Y.*

Circle 209F on Reader Service Card

Dairy Cleaner

Folder illustrates use of dairy cleaner for expediting and economizing sanitation in dairies, creameries, milk and ice cream plants.—*Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14.*

Circle 209G on Reader Service Card

Packaging Materials

Papers, plastics, and foils are among packaging materials listed in catalog.—*Kennedy Car Liner & Bag Co., Inc., Shelbyville, Ind.*

Circle 209H on Reader Service Card

Rigid Plastic Pipe

Properties, applications and installations with new compression-type coupling of rigid plastic pipe are discussed in leaflet.—*Carlon Products Corp., 10225 Meech Ave., Cleveland 5.*

Circle 209I on Reader Service Card

Drink Flavors

Technical Bulletin 53-1 contains information on manufacture of flavored drinks, including syrup formulae.—*Gidanyan Flavors, Inc., 330 W. 42nd St., New York 36.*

Circle 209J on Reader Service Card

Corrosion-Resistant Alloys

Alloys featuring corrosion resistance, strength, and design economy are shown as applied to processing in Bulletin PI 3a. 20 pages.—*Ampco Metal, Inc., Milwaukee 46.*

Circle 209K on Reader Service Card

Miscellaneous

Electric Typewriters

Booklet illustrates and describes advantages of electric typewriters. 16 pages.—*Remington Rand Inc., 315 Fourth Ave., New York 10.*

Circle 209L on Reader Service Card

Duct Calculator

Slide chart provides correct duct sizes.—*Ducon Co., 147 E. Second St., Mineola, Long Island, N. Y.*

Circle 209M on Reader Service Card

Stress Rupture

Data Card TDC-153 presents stress rupture information on tubing steels and other materials designed for high temperature service.—*Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.*

Circle 209N on Reader Service Card

Safety Posters

Brightly illustrated posters carry message of safety as well as offering descriptions of food plant equipment.—*John E. Smith's Sons Co., 50 Broadway, Buffalo 3, N. Y.*

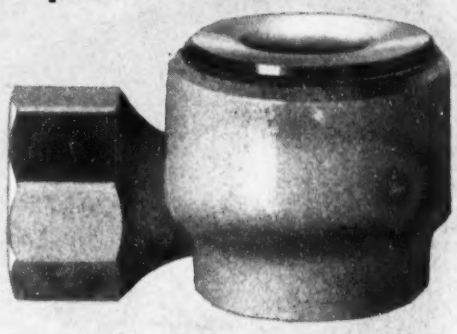
Circle 209O on Reader Service Card

Sound Signals

Advantages of industrial sound signals are featured in catalog.—*Benjamin Electric Mfg. Co., Des Plaines, Ill.*

Circle 209P on Reader Service Card

precision instrument



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S. W. ARENSON, DIRECTOR
Service to the Baking and Potato Chip Industries
Baking, Frying, Chemical, Physical
Product Development Formulation Quality Control
1403 Eutaw Place 1133 Broadway
Baltimore, Md. New York, N. Y.

GUSTAVE T. REICH
Consulting Chemical Engineer
Continuous Processes Starch
Complete Plants Yeast, Molasses
Alcohol - Dry Ice - Waste
1422 Chestnut St. Philadelphia 2, Pa.

STRASBURGER & SIEGEL
Chemists — Bacteriologists — Food Technologists
Specialists in Canned and Glassed Foods
Laboratory Services
Testing Tomato Products, Mayonnaise, Pickles, Oils, Fats, Beverages, Sugars, Filth in Foods, Food and Drug Labels, Expert Testimony
1703 Eutaw Place Baltimore 17, Maryland

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WHERE TO STORE FROZEN FOODS

QUAKER CITY COLD STORAGE CO., Inc.
PHILADELPHIA, PA.
3 WAREHOUSE LOCATIONS
Proper Temperature for Frozen Foods

New Advertisements

received by July 24 will appear in the August issue subject to limitation of space available. Address copy to the

FOOD ENGINEERING
330 W. 42nd St., New York 36, N. Y.

Ingredients
For the Food Processor

CARROT OIL makes foods golden yellow

Carrot oil, like butter, contains carotene. Carrot oil is extracted from carrots, and each pound contains up to 25 million units of carotene, the international standard of vitamin A.
Carrot oil is preferred for vitaminizing foods because it is a natural vegetable oil and because it contributes vitamin A of high stability and desirable golden yellow color. Carrot oil is not synthetic, does not contain animal fats of any kind, and does not produce fishy flavor.

SEND FOR BOOKLET
New 36-page combined catalog on carrot oil for foods, feeds, and pharmaceuticals. Important reading for most food processors. Write today!

NUTRITIONAL RESEARCH ASSOCIATES
205 Broad St., South Whitley, Ind.

If this or other advertising does not supply the information wanted concerning ingredients for the food processor, please write:
FOOD ENGINEERING

CLASSIFIED SEARCHLIGHT SECTION ADVERTISING

EMPLOYMENT • BUSINESS • OPPORTUNITIES • EQUIPMENT—USED or RESALE

UNDISPLAYED RATE:

$1.20 a Line—Minimum 3 Lines.

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The advertising rate is $11.50 per inch for all advertising appearing on other than a contract basis. Contract rates on request.

AN ADVERTISING INCH is measured ⅞ inch vertically on one column, 3 columns—30 inches—to a page.

Send NEW ADVERTISEMENTS to New York Office, 330 W. 42nd St., New York 36, N. Y., for the August Issue closing July 24th

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

PRODUCTION MAN for Food Manufacturer: Institutional, Restaurant, Bakers and Ice Cream ingredient supplies. Complete resume of experience, qualifications, salary desired. Stuart Hale Company, 2529 N. Pulaski Road, Chicago, Illinois.

SELLING OPPORTUNITY OFFERED

WANTED—SALES Representative to represent a leading national corrugated container manufacturer in the midwest. This position entails representation in any one of the following states: Illinois, Indiana, Michigan, Wisconsin, Ohio. Salesmen now calling on canners handling allied products who wish to represent this company on a part-time basis may be considered. Excellent earning opportunities coupled with a company sponsored pension plan. Furnish full particulars. All replys confidential. RW-8238, Food Engineering.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $5,000-$25,000. This confidential service, established 1927, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. F, 241 Orange St., New Haven, Conn.

POSITIONS WANTED

PRODUCTION MANAGER, eight years experience direction of food processing plants; packaging specialist, mechanical background. Take complete charge medium-sized plant. PW-8003, Food Engineering.

PROCESSOR OF Specialized Poultry Products requires a qualified person to manage and expand a small business. Experience in sales, distribution, and plant operation is mandatory. Lesser requirements include advertising, packaging, accounting, etc. Located in Connecticut, residence provided. In your reply state age, experience, salary expected. PW-7768, Food Engineering.

YOUNG QUALITY Executive — 7 yrs. varied production and administrative experience. Have successfully applied statistical quality control to plant operations, uniformity control and consumer research. Harvard grad, presently employed, with capacity and desire for a bigger job. PW-8266, Engineering & Mining Journal.

PRODUCTION SUPERVISOR, capable technologist, thoroughly experienced processing and packaging operations desires opportune connection with established manufacturing organization where quality and volume production are prime requisites. Good background in various industry fields including frozen foods and prepared speciality items. Will relocate. PW-8273, Food Engineering.

PLANT OR Production Manager: Experienced Branch Plant Manager of leading food company. Knows scientific management, cost, labor relations, production and distribution. B.S. Degree in Industrial Engineering. PW-8278, Food Engineering.

Food Technologist M.S., A.B. Biochem. 6 yrs exp. general & research labs., prod. control & development projects. Married, 37, veteran. Prefer West Coast or foreign. PW-7168, Food Engineering.

FOOD TECHNICIAN

Experienced food technologist to handle technical sales problems in use of starches, syrups, monosodium glutamate, lecithin and other corn and soybean products used by confectionery, ice cream, canned goods, frozen foods, prepared mixes, soups and many other food industries. Job requires man who is technically trained, aggressive, sales minded and willing to travel. Will be located in Decatur, Illinois. Write Personnel Department.

A. E. STALEY MFG. CO.
Decatur, Ill.

GENERAL PRODUCTION MANAGER

To coordinate all production activities for the largest house-to-house bakery with plants in Omaha, Indianapolis, Peoria, Milwaukee, Columbus, and Cleveland—headquartering in Omaha.

Prefer chemical engineer with successful record of experience in modern mechanized production methods and who has demonstrated he can handle himself and others. Bakery experience desirable but not essential.

Age range 30-45, salary open.

Outstanding opportunity for someone who can accept responsibility in a rapidly expanding organization.

Reply held confidential if desired. Write giving complete resume of background including past earnings to J. B. Fagot, OMAR Incorporated, 1910 Harney, Omaha, Nebraska.

WE NEED!

FOOD TECHNOLOGISTS and FOOD CANNING CANDIDATES
—juniors to top-level.

Call, write or wire:

Gladys Hunting (Consultant)
Drake Personnel, Inc.
7 W. Madison St. Chicago 2, Ill.

MODERN FOOD PLANT AND EQUIPMENT

Completely automatic filling, labeling and screw capping equipment. Tank car equipment and storage for liquid sugar, corn syrup, vinegar, and aqua ammonia. Tank car storage pays all overhead. List of equipment on request. Located in Detroit selling to wholesale grocers and chains. Established 1937—Six car siding.

BO-8086—Food Engineering
330 W. 42 St., New York 36, N. Y

FOOD PLANT WANTED

We are now manufacturing over $20,000,000 in various lines and wish to expand by acquisition of assets of stock of one or more industrial companies. In our negotiations the sellers' problems and wishes will receive full consideration. Present personnel will normally be retained.

Address all replies
"Confidential" C. J. GALE, Sec.
233 Broadway, N. Y. 7, N. Y. BA 7-1819

WANTED
TO EXPEDITE PRODUCTION

Food Processing Equipment including Aluminum and S/S Kettles, Mixers, Vacuum Pans, Dehydration equipment, Grinders, Elevators, Stills, Colloid Mills, Conveyors, Filters, Packaging Units, Wrapping Machines. Will consider a set up plant now operating or shut down. When offering give full particulars.

P. O. Box 1351
Church Street Sta., New York 8, N. Y.

An Investment!

Productive advertising is an INVESTMENT rather than an EXPENDITURE.

"Searchlight" advertisers almost invariably report prompt and satisfactory results.

BE CONVINCED — send us your advertisement TODAY.

Address
Classified Advertising Division

FOOD ENGINEERING

330 W. 42nd St., N. Y. 36, N. Y.

AN INDUSTRIAL "LUCKY STRIKE" TO LOCATE NEEDED EQUIPMENT At the RIGHT TIME and PRICE!

Send for the Complete FMC List!

KETTLES, TANKS, COOKERS, VACUUM PANS, CONCENTRATORS, EVAPORATORS

New Stainless Steel Steam Jacketed Kettles in all standard sizes.
New Stainless Steel Vertical and Horizontal Tanks, all sizes.
Rebuilt and Tested Copper Steam Jacketed Kettles, all sizes.
Stainless Steel Oval (truck type) Tanks.
Steel Jacketed Tank; 5200 Gal. welded; 9'6" x 9'10½".
2000 Gal. Copper Vacuum Pan or Cooker with coils; 7' diameter x 10'6" high.
2600 Gal. Steel Closed Top Jacketed Kettle; 8' x 7' with agitator.
650 Gal. Dopp Jacketed Agitated Kettles or Reactors; 68" x 61".
Buflovak 500 Gal. Steel Jacketed Agitated Kettle; 48" x 62"; 3 HP.
Pfaudler Jacketed Glass Lined Reactor 4' x 4'.
500 Gal. Stainless Steel Jacketed Reactor; 6' x 6'.
250 Gal. Aluminum Vacuum Pan with Copper Jacket.
Stainless Steel Flash Tank welded construction; with stainless tube bundles; 8' x 6'.

RETORTS, STERILIZERS, DRYERS, ETC.

Food Machinery Corp., A. K. Robins and other Pressure Retorts from 40" x 60" to 42" x 96" vertical and horizontal.
Special Lot of Heavy Duty Horizontal Steel Retorts with heavy doors, tracks and steam pipes; 66" x 14'7".
Dryers and Dehydrators; Cabinet type, apron conveyor type and tunnel type.
Devine and Buffalo Vacuum Chamber Dryers; 20 shelf; 42" x 42" with accessories.
Buffalo Chrome Plated Rotary Vacuum Drum Dryers; 3' x 12'.

FILTER PRESSES AND FILTERS

Shriver and Sperry Plate & Frame Filter Presses with wood, iron, rubber, aluminum contact parts.
Disc and Plate Filters by Alsop, Ertel, Sparkler, Niagara in all sizes and capacities.

FRED. FIRSTENBERG, Pres.

FILLING EQUIPMENT

Food Machinery Corp. M. & S. 10 Pocket Stainless Steel Fillers now set for baby food, tomato paste and similar products; adjustable.
Food Machinery Corp. M. & S. 6 Pocket Bronze Fillers for Dog Food, Oils, soups, purees and similar materials; all size containers.
Horix Stainless Steel Model HEV 14 Stem Rotary Gravity-Vacuum Fillers.
Mojonnier No. 90 Stainless Steel 14 Head Rotary Gravity-Vacuum Fillers.
Berlin Chapman Rotary Stainless Steel Juice Fillers for No. 2 and No. 10.
Food Machinery Corp. Hand Pack Fillers with Stainless Top Plates.
Pneumatic Scale Semi and Fully Automatic Samco Type Vacuum Fillers.
FMC Straight Line and Rotary Stainless Steel Syphon Fillers for Pts. to Gals.
FMC Straight Line Stainless Vacuum Fillers all sizes Pts. to Gallons.
Elgin Filler Mach. Co. and Powers, Hope Piston Fillers from single to 11 Pistons; stainless or plated contact parts all size containers.
Fillers, semi automatic and fully automatic for Powders and Granulars by Stokes and Smith, Triangle, Whiz... sack and bag Packers too.

MIXERS

Heavy Duty Dough Mixers, single and matic for Powders and Granulars by every purpose; sizes from ½ bbl. to 6 bbl.
J. H. Day Egg Clipper Type Jacketed Mixers; 20" x 22" x 28".
Robinson Unique Stainless Steel Powder Mixer; 17" x 20" x 30".
NEW and REBUILT Powder Mixers in mild steel and stainless steel usually every wanted size in stock.
J. H. Day extra heavy JUMBO Mixer; 94 cu. ft. capacity; 44" x 78" with extra heavy ribbon; 10 H.P. motor.
Sprout Waldron Steel Ribbon Mixers; 283 cu. ft. 5' x 5'8" x 10'.
Munson Rotary Batch Mixer 5' diameter, 40 cu. ft. working capacity.
Marquette Paddle Type Tubular Mixer 24" x 12'; steel construction.
Stainless Tumbling Barrel Mixer; 5' x 5'; with 3 H.P. and reducer.

FIRST MACHINERY CORP.

157 HUDSON ST. WOrth 4-5900 NEW YORK 13, N. Y.

FOR SALE

Bag Sealer: Amsco Hy-Speed model S.
Pulverizers: Mikro SH, 1SI, 4TH.
Dryer: Roto Louvre 5x20', monel metal.
Powder Mixers: 100 to 2000 lb. capacities.
Liquid Fillers: Vacuum and Siphon types.
Mixer: Read 380 gal., st. steel, 50 hp.
Centrifugal: Sharples airtight st. steel.
Kettles: Stain. Steel, all sizes, new and used.
Filter Presses: 7, 10, 12, 24".
Screens: 20 x 48" Rotex and Robinson.
Mixers: Abbe Lenart s.s., 10 and 100 gal.
Fillers: Geyer, Kiefer, Visco, M&S., Elgin.
Labelers: New Jersey, World, Knapp, Burt, Ermold.
Dough Mixers: Day, Read, Hobart, Champion.
Cappers: Capem Pneu. Scale, Elgin, U. S.
Vacuum Pans: 36" and 42" stainless steel.
Filters: Alsop, Ertel, Sparkler, Industrial.

Send us a list of your idle equipment

LOEB EQUIPMENT SUPPLY CO.
1931 W. North Ave. Chicago 22, Ill.

FOR SALE

1—#2 Day Brighton Pony Mixer
1—Size 15 Class C Type VII Baker Perkins Mixer

FS-8053, Food Engineering
330 W. 42 St., New York 36, N. Y.

Charles S. JACOBOWITZ *Co.*
3083 MAIN STREET · BUFFALO 14, N.Y. · AMHERST 2100

ONE PIECE GLASS LINED TANKS

We have the largest stock of one-piece glass enamel lined tanks in the country. Space does not permit complete listing of all of these tanks, but they range in sizes from 3,000 gallons—15,000 gallons each. Both horizontal and vertical, still erected in the breweries which we are dismantling, complete with man-holes, stands, fittings. Immediate delivery.

Tell us your requirements for tanks, and we will send you complete listings of these tanks, and also one-piece steel tanks, rectangular tanks, etc.

No obligation. Also tell us what surplus equipment you have to dispose of.

Serving American Industry for over 35 Years

ECH Offers UNUSUAL BUYS

A Photo Can Be Sent on Request

J. H. Day 2,000 Lb. Mixer with #31 Roball Sifter & Unloader, Center Discharge with 20 HP motor & Drive
Transwrap Machines, Model A-B & BB
Capem, Resina, Kramer & Elgin Cappers
Mikro Pulverizers #1, #2, #3 & #4
Day #31 Roball Sifter, 20" x 48" with motor
Day S/S Var. Mixer, Jkt'd., Sigma Arms, 5 gal.
Burt & Knapp Can & Jar Labelers for all sizes
Robinson Attrition Mill, 24" Double Runner
Standard Knapp #429 Case Sealer & 20' Comp. Belt
Raymond Imp Mills #40 New #0000 with 10 HP
2 Gehnrich Shelf Dryers, 33" x 42" x 50"
Ross Heavy Duty, 40 gal. Pony Mixer
King Pfaudler 12 spout S/S Can Filler, 6 to 46 ozs.
2200 Gal. S/S Horizontal Tank, 17" manhole
Packaging Equipment of All Kinds, Makes & Sizes
Gluers, Wrapping, Dry & Wet Filling, etc.
New & Used Blenders, Steel & S/S, all sizes

Phone SOuth 8-4451—9264—8782
YOU CAN BANK ON

EQUIPMENT CLEARING HOUSE, INC.
289-10th ST., BKLYN 15, N. Y.

NEW REBUILT USED

MACHINERY

FOR FOOD & CHEMICAL PROCESSING

- Bump 1" SS Pump & Motor
- 4 Head Capem Screw Capper
- Mojonnier 14 SPT Filler
- Stainless Steel Tanks
- World Rotary Labelers
- Horman Disc Filters
- Bottle Washer for Gallons

IN STOCK
FOR IMMEDIATE DELIVERY

PROCESS INDUSTRIES
307 POWELL ST. BROOKLYN 12, N.Y.
DICKENS 2-1021

FOR SALE

4 ft. & 5 ft. Stainless Steel Vacuum Pans.
200 gal. S.S. Tank, 36"x48", 1½ H.P. agit.
250 gal. S.S. Tank, 42"x42", agit.
150 gal. S.S. Jkt. Kettle, 42"x34", agit.
100 to 200 gal. S.S. Mix Tanks, water jkt.
300 to 4000 gal. Glass Lined Tanks.
26" Centrifugal Extractors, 3 H.P.
75 to 1500 gal. Homogenizers or Viscolizers.
Model 148C Stokes Vacuum Pump, 1½ H.P.
Quincy Vacuum Pump, ½ H.P.
3000 gal. S.S. Truck Tanks, Trailerized.
32"x90" Buflovak Double Drum Dryers.
5 H.P. Copeland Freon Refrigerating Unit.
3 Ton Fork Lift Truck, solid tires.
25 H.P. International Boiler with Stoker.
Milk Pasteurizers, Coolers, Fillers, Washers.

Send us your inquiries

LESTER KEHOE MACHINERY CORP.
1 East 42nd Street New York 17, N. Y.
Murray Hill 2-4616

WE HAVE IN STOCK
FOR IMMEDIATE DELIVERY
THE FOLLOWING TYPES OF EQUIPMENT

BOILERS
CANNING
CONFECTIONERY
DAIRY
FILLERS
MATERIAL HANDLING
STAINLESS STEEL JACKETED KETTLES
MEAT PACKING
MIXERS
MOTORS
PULVERIZERS
PUMPS
REFRIGERATION
SCALES
STAINLESS-STEEL TANKS
LARGE & SMALL STEEL TANKS

Consult Us for Your Food Processing Equipment
Send Us Your Inquiries
We Buy One Item or Entire Plants

AARON Equipment Company
1347 So. Ashland Ave., Chicago 8, Illinois
PHONE: CHesapeake 3-5300

3-WAY BENEFIT

- BALANCED BUDGET
- DOLLARS SAVED
- PROFITS INCREASED

WHEN YOU DEAL WITH A LONG ESTABLISHED COMPANY*

*AAA-1 RATED

10—Anderson Duo Expellers, each with Tempering Apparatus and 50 HP AC Motor. Very Favorably Priced.

1—Patterson 500 gal. steel jacketed, closed, agitated Kettle, 125# jacket.
8—Shriver 42" x 42" cast iron Pl. & Frame Filter Presses, 18, 27, 36, 54 chambers, 1" cake.
15—Sperry 18" x 18" cast iron Filter Presses, P. & F., 11 chambers.
1—30" x 30" Shriver Filter Press, cast-iron, steam-heated.
1—Quadruple Effect Evaporator, Calandria Type, Brass Tubes, 14,000 sq. ft. heating surface.
4—Devine # 28 Vacuum Shelf Dryers, ea. 20 shelves 59' x 78" Complete.
3—6' x 50' Louisville Rotary Steam Tube Dryers.
6—Horiz. Dry Mixers, 12,000#, 2,000#, 1,000#, 600#, 400#, 300#.
1—Day size 30 Imperial unjacketed Stainless lined, Stainless blades, 75 gal.
8—Oliver Vacuum Filters, incl. 8 x 12' 11'6 x 14', 11'6 x 18.
1—Mechanical 5' x 16' jacketed Cooker.
3—Mikro Pulverizers, 2TH, 2SI, 4TH.
1—#12 Sweetland Filter for 72 Monel leaves on 2" centers.
1—Std. Knapp #429 Self-adjusting Gluer-Sealer & Compression Unit.
1—Buflovak 6' Vacuum Crystallizer.
6—Vert. Retorts, 42" x 72", late type, with instruments and crates.
1—K.K. Rotary Vacuum 12 Stem S/S Filler and Capem Capper.
1—Prog. 2 spout S/S Filler, qts. and gals.
3—Lee S/S jack. Vacuum Pans, 250 gals., 300 gal., 500 gal.
1—Shriver 18" x 18" Alum. Filter Press.
1—Patterson S.S. 110 gal. Vacuum Mixer, sigma blades.
4—Buflovac Atmo. Dbl. Drum Dryers, 32" x 72", 32" x 90", 42" x 120".
6—Dopp c.i. Kettles, 80, 150, 350, 600 gal.
3—Anco 4' x 9' Chilling Rolls.

Only a Partial Listing

OUR 36th YEAR

CONSOLIDATED PRODUCTS COMPANY, INC.

13-17 PARK ROW
NEW YORK 38, N. Y.
BArclay 7-0600

We Buy Your Idle Machinery

IN STOCK

10—Stainless Steel shell and tube heat exchangers from 14 sq. ft. to 400 sq. ft.
60—Stainless Steel and Stainless Clad Steam Jacketed Kettles, 40, 60, 80, 100, 150, 500 gal.
3—Lee 300 gal. T316 stainless steel salad dressing starch base cookers, water jacketed, double motion agitators.
5—3000 gal. Horiz. Stainless Steel Tanks, insulated & agitated, sanitary fittings, excellent for transporting, storing or holding milk, food products, wines, etc.
35—Stainless Steel Tanks, 30, 60, 100, 150, 200, 300, 400, 500, 1000, 3000, 5700 gal.
35—Aluminum Tanks, closed, 275, 330, 480, 500, 1350, 1450 gal.
8—15,000 gal. Vertical Steel closed Processing Tanks, 80# int. W.P., with 970' 3" pipe coil and turbine agitator with 40 HP drive.
2—Triangle G-2-C Elec-Tri-Pak Weighers & Fillers.
1—Elgin Twin Piston Filler.
2—Mojonnier #90 Rotary Vacuum Fillers, 14-spout; stainless.
1—Pneumatic Scale Auto. Duplex Labeler, Front & Back.
1—Kyler model "H" Wrap Around Labeling Machine, to #10 cans.
1—N. J. Semi Auto. Labeler.

WELDED STEEL TANKS

Brewery Lining

AT NORFOLK, VA.—Lastiglas lined:
(4) 15,200 gal. Horizontal
(3) 5,800 gal. Horizontal
(2) 6,600 gal. Vertical, open
(1) 3,500 gal. Vertical, open

AT TONAWANDA, N. Y.—Mammut lined:
(5) 7,000 gal. Vertical, closed

AT MOUNT CARMEL, PA.—Mammut lined:
(9) 4,650 gal. Horizontal
(5) 4,300 gal. Horizontal
(2) 3,875 gal. Horizontal

AT MARION, IND.—Mammut lined:
(8) 12,700 gal. Horizontal
(2) 11,300 gal. Horizontal
(2) 10,500 gal. Horizontal

PERRY EQUIPMENT CORP.

1411 N. 6th St. PHILA. 22, PA.

FOR SALE
BUTTER PACKAGING EQUIPMENT

1 Doering 2500 butter cutter, with stainless steel head and tray $500.00
3 Morpac Jr. ¼ wrappers. Each..... $800.00
1 Knapp wrapper for overwrapping for quarter lbs. into a wax wrapper $1,875.00

All this machinery is in excellent condition and will do a fine job for many years.

F. F. Lowenfels & Son, 16 Jay St., N. Y. 13, N. Y.

FOR SALE
MARGARINE FILLERS

3—Athright-Nell, Complete with conveyors, motors, speed reducers, sealers, Pyrometers and S. S. overflow tanks. Used for manufacture of 1 lb. polyethylene squeeze-pack margarine. Purchased new 1948. Attractively priced.

G. J. Erlinos

The Glidden Company—Cleveland 14, Ohio

A BRILL BUY
. . . IS THE BEST BUY

SEE THESE VALUES!

1—Sharples C-27 Super-D-Hydrator, 316 Stainless Steel.
1—Hersey 4' x 26' Monel Rotary Dryer.
1—Hersey 3' x 26' Stainless Steel Rotary Dryer.
1—Link Belt Monel 2'7" x 8' Roto-Louvre Dryer.
4—Devine Vacuum Dryers 4, 6 and 10—40" x 43" shelves.
1—Devine #27 Vacuum Dryers 17—59" x 78" shelves.
2—Stokes 30" x 8' 3' x 15' Rotary Vacuum Dryers.
2—Pfaudler 1000 gallon, glass-lined, jacketed, agitated Kettles.
2—Pfaudler 100 gallon, glass lined, jacketed Stills with condensers and receivers.
3—Buflovak 5' x 12', 42" x 120", 42" x 90" double drum Dryers.
3—Groen 150, 125 gallon, Stainless Steel, agitated, jacketed Kettles.
3—Mikro Pulverizers #2TH Stainless Steel, #1SI, #1SH.
1—Day 2000# Powder Mixer and Sifter.
1—Robinson 4000# Heavy Duty Mixer.
6—Rotex 40" x 120", 40" x 84", 20" x 48' single and double deck Sifters.
1—Sperry 24' Aluminum P&F Filter Press.
1—Fletcher 48" Aluminum Suspended Centrifugal.

Send for complete stock list

BRILL EQUIPMENT COMPANY

2401 Third Ave., N. Y. 51, N. Y.
Tel: CYpress 2-5703 - Cable: Bristen, N. Y.

IF there is anything you want . . .

that other readers
of this paper
can supply

or—

something you don't want

that other readers
can use,
advertise it here—
in the

SEARCHLIGHT SECTION

MODERN REBUILT EQUIPMENT
At Tremendous Savings

UNION Rebuilt Machinery — Established 1912

- International Stainless Steel Straightline Vacuum Filler, with automatic Feeder.
- Resina Model LC automatic Capper.
- Kyler A and Burt adjustable Wraparound Labelers.
- Baker Perkins BB, JNM and Readco Heavy Duty 50 to 150 gal. Double Arm Jacketed Mixers, Sigma or Fish Tail Blades.
- Day and Robinson Dry Powder Mixers and Sifters, 100 to 10,000 lbs. cap.
- J. H. Day 75 gal. Imperial Double Arm Steam Jacketed Mixer.
- J. H. Day Pony Mixers, 8 gal. cap.
- B. P. type 3500 gal. Steam Jacketed Double Arm Mixer.
- Day 650 gal. Jacketed Jumbo Mixer.
- Stokes, Day, New Era, Hottman Mixers, 2 to 3500 gals. with/without Jackets, Single and Double Arm Agitators.
- Baker Perkins 150 gal. Unidor Steam Jacketed Double Arm Mixer.
- Tri-Colloid #5 Mill and Homogenizer.
- Mikro 4TH, 3TH, 2TH, 1SH, Bantam (S.S. also) Pulverizers; Schutz O'Neill, Stedman Mills.
- Allis Chalmers, Great Western Sifters.
- Colton 2, 3 Rotary Tablet Machines.
- Pony M, ML Labelrites; Ermold, World semi, fully automatic Labelers.
- Stokes & Smith Transwrap Filler.
- S. & S. G1, G2 and G6 Auger Fillers.
- F. J. Stokes HG88 Duplex Auger Filler.
- Whiz Packer and Triangle Fillers.
- Triangle Package Models, G2C, G2S, N2CA Elec-Tri-Pak Fillers.
- Horix and Elgin S. S. Rotary Fillers.
- Filler 4-Head S. S. auto. Piston Filler.
- Stokes, Colton semi auto. and auto. Tube Fillers and Closers.
- Doughboy, Amsco Rotary Bag Sealers.
- Standard-Knapp No. 429 Carton Sealer.
- Hudson Sharp Campbell automatic cellophane Wrapper.
- Hayssen; Package Machy. Co. FA, FA4, DF, CA2; Miller and Scandia automatic cellophane Wrappers.
- Oliver 799E auto. cellophane Wrapper.
- Shriver, Sweetland, Alsop Filter Presses.
- Huhn Steam and Gas-Fired Rotary Dryers.
- Pneumatic automatic Cartoning Unit, 60 and 30 per min.

Additional Information and Prices Available on Request

UNION STANDARD EQUIPMENT CO.
318-322 Lafayette Street New York 12, N. Y.

TOP PRICES PAID FOR YOUR SURPLUS EQUIPMENT

–FOR SALE–

1—Niagara Stainless Steel Jacketed Filter, Model #140-36.
1—Oliver Rotary Steel Continuous Filter, 11'6" x 14'.
3—Shriver Aluminum Plate & Frame Filter Presses, 24" x 24", Closed Delivery, 35 Chambers.
1—Sharples Stainless Steel Super-D-Hydrator, Model #C-27.
1—Link Belt Stainless Steel Roto-Louvre Dryer #310-16.
1—Buflovak Stainless Steel Rotary Vacuum Dryer, 5' x 20' with all auxiliary equipment.
1—Louisville Rotary Indirect Fired Experimental Dryer, 12" x 7½' complete.
3—J. H. Day #30 Imperial Jacketed Double Arm, Sigma Blade Mixers, 75 Gal. Working Capacity.

R. GELB & SONS, INC.
Est. 1886 UNION, N. J. UNionville 2-4900

FOR SALE

M&S ALL STAINLESS CAN FILLER
10 Valve for 303.
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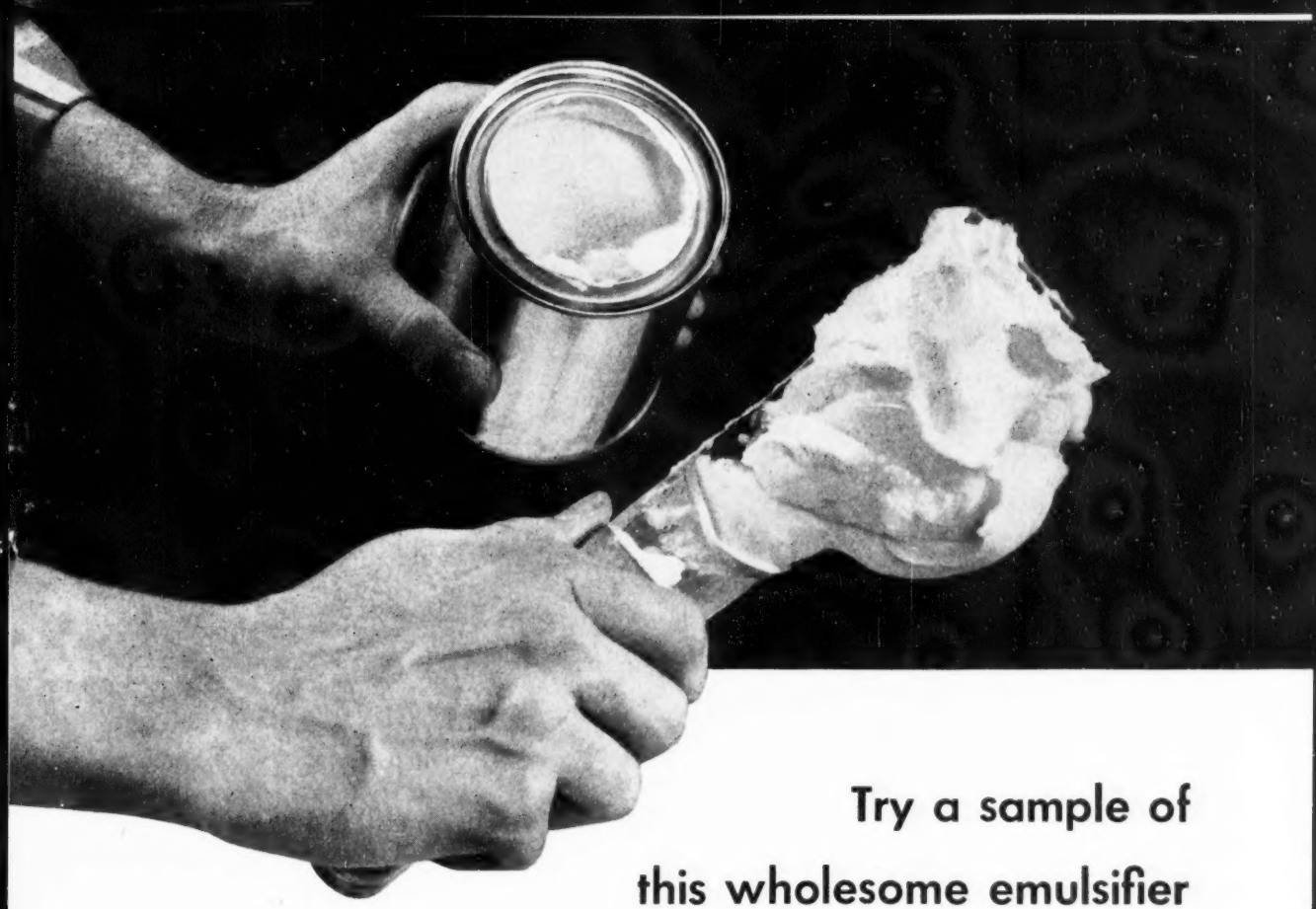

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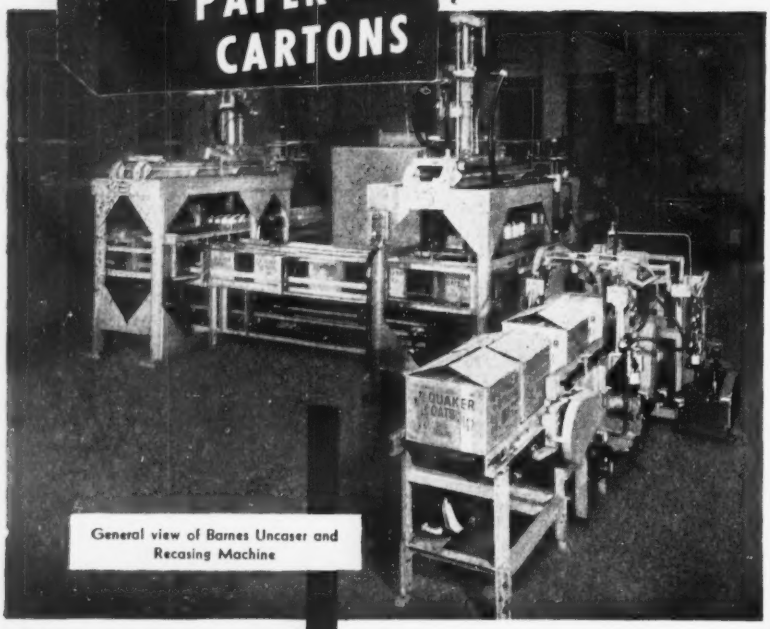
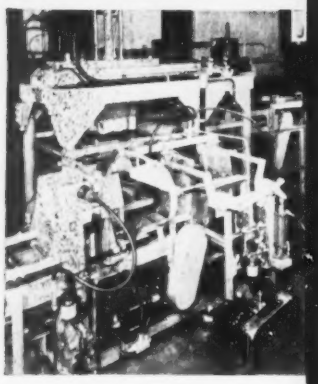
IF YOU USE PAPER CARTONS

Investigate This Barnes Uncaser and Recasing Machine



General view of Barnes Uncaser and Recasing Machine

This new magnetic Uncasing and Recasing machine unloads and reloads 200 cartons per hour. Each carton holds 36 cans. Paper cartons of empty cans are conveyed to the flap opening station where one pair and then the other pair of flaps are opened by vacuum lifters. The carton is then transferred to position under a rectangular magnet which lifts the cans out onto a belt conveyor. There are two layers of cans in a carton so the magnet operates twice for each carton.



View showing vacuum lifters

The belt conveyor moves the cans to an "unscrambler" which delivers them single-file to the filler. After filling, the cans are conveyed back to the machine for recasing.

Detailed view of reloading station

FREE ADDITIONAL DATA on this and other Barnes Processing equipment is available upon request. Ask for bulletin E-753.

W. F. and JOHN BARNES

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ASEPTIC CANNING CREAM STYLE CORN

The Martin Aseptic Canning System offers a means of eliminating the processing in the can by taking advantage of short-time high-temperature sterilization of the product in a closed heat exchange system and filling it cold into a sterile can.

CORN PROCESSED OUTSIDE OF CANS

Attractive features of the Martin System include continuous straight-line flow of both the product and the cans, low utility requirements, small space requirements, low manpower costs, and improved flavor, color and quality in the finished product. One feature of particular interest is the fact that because the corn was processed outside of the can, the finished canned product has identical quality regardless of size of container used.

CARMELIZED TINT ELIMINATED

Test cuttings of the Aseptic pack show that the product produced by this method has a vast improvement in color by eliminating the characteristic brown or carmelized tint found in present in-the-can processed cream style corn.

Two papers were delivered at the Canning Machinery & Supplies Association Convention recently. These papers offer additional information on Aseptic Canning and are available upon request. Write to W. F. and John Barnes Company, 301 South Water Street, Rockford, Illinois.

Gaylord Boxes are Easy to Set Up... Hard to Break Down

Solid, straight-standing Gaylord Boxes are designed for fast handling and product protection . . . from packing until final delivery. Your best assurance of tough, resilient, corrugated boxes is Gaylord's careful quality control . . . from the planting of pulp forests, through every step of box manufacture.

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Their seen and unseen quality gives you an extra margin of safety.

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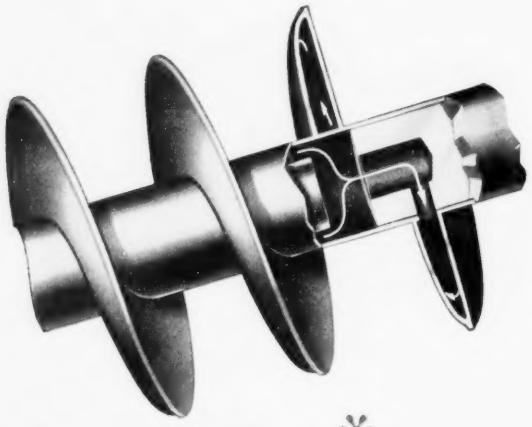
CORRUGATED AND SOLID FIBRE BOXES • FOLDING CARTONS • KRAFT BAGS AND SACKS • KRAFT PAPER AND SPECIALTIES

A great new advancement in heat exchangers...



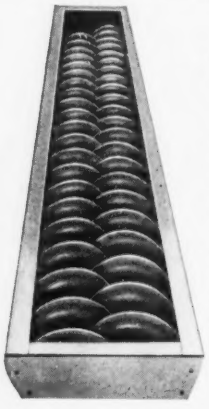
THE holo-flite* PROCESSOR

(HOLLOW-FLITE)

A simpler, more compact way to cool slurries, solids or pastes—in continuous flow!

Do you have processes where slurries, solids, pulps or pastes must be cooled or cooked? Do you know you can now handle such processes—*in continuous flow*—in as little as 1/5th the space required by other types of heat exchangers—and with many other important advantages?

The newly-developed HOLO-FLITE Processor is the answer!



what IT IS!

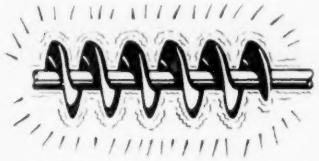
Basically the HOLO-FLITE consists of two or more flights of hollow-bladed screw conveyors. The product to be processed moves in a trough around the conveyor screws. The heat-transfer fluid circulates through the hollow blades and shafts of the conveyor. The product is constantly rotated into, around, under and over the blades and shafts through which the heat-transfer fluid is circulating, assuring quick, uniform heat passage between the two mediums—*as the product is continuously moved along in a bulk-flow without interruptions!*

Get the complete story on HOLO-FLITE *savings and how this new advancement can simplify your processing operations. It is backed by the same organization that pioneered* COTTRELL *Precipitators and* MULTICLONE *Collectors—your assurance of complete dependability.*

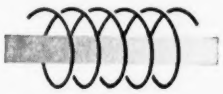
DETAILED INFORMATION!
New 8 page bulletin describing HOLO-FLITE features and applications will gladly be sent on request. Write, wire or phone for your free copy!

why IT'S BETTER!

The HOLO-FLITE principle provides many important advantages in modern processing operations...



ITS LARGE HEAT-TRANSFER SURFACE requires far less space—as little as 1/5th the space required by other heat-exchange equipment. Further, flights can be "stacked" as high as desired to save floor space, simplify installation!



ITS SLOW ROTATION IS SO GENTLE that granular and powdered solids are handled with no dusting—little or no particle abrasion. Result—no dust recovery problems . . . simple, inexpensive installation.

IT IS ADAPTABLE to a wide range of applications—handles solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, water or other fluids to provide a wide range of temperatures. Cooled products can be packed directly from HOLO-FLITE discharge, saving time, space and additional handling.

IT CAN BE DESIGNED to handle virtually any capacity by varying the diameter and length of the flights, and the number of "tiers."

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